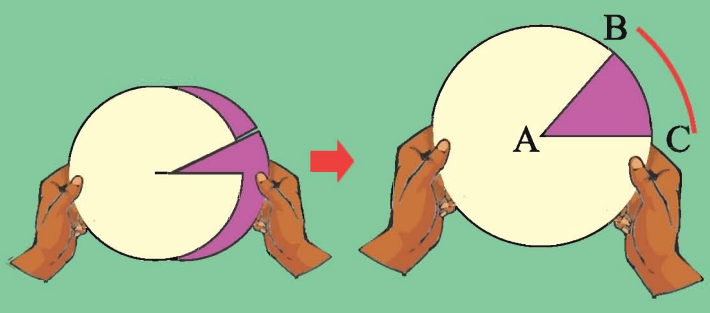
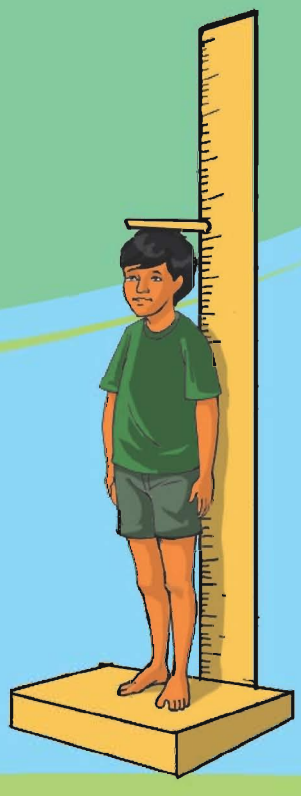
Elementary Mathematics

CLASS FOUR





	difference			minuend			minuend	
+	subtrahend		–	subtrahend		–	difference	
	minuend			difference			subtrahend	

Oh, 3 is the **common factor** of 15 and 18!

$$\frac{15}{18} \overset{\div 3}{=} \frac{5}{6}$$

$$\frac{\cancel{15}^{5}}{\cancel{18}_{6}} = \frac{5}{6}$$

We can do like this as a simple method.

National Curriculum and Textbook Board, Bangladesh

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Elementary Mathematics

Class Four

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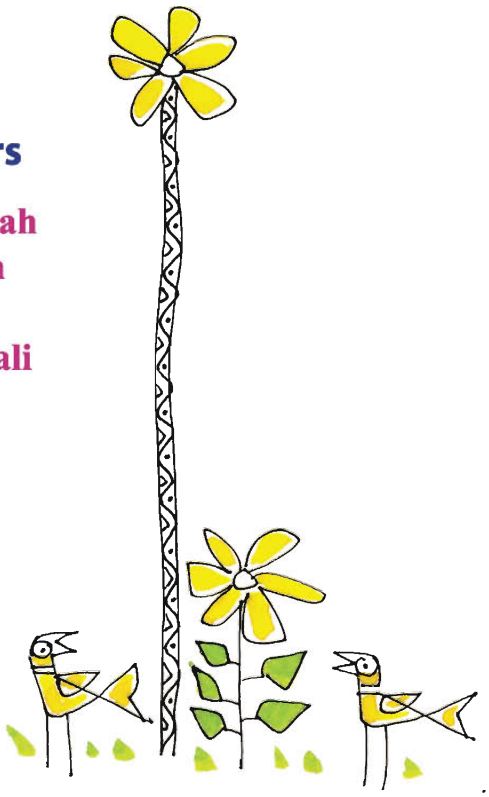

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Preface

A child is a great wonder. There is no end to the thinking about his/her world of wonder. A child is a subject of contemplation for educationists, scientists, philosophers, child specialists and psychologists. The fundamental principles of children education outlined in the National Education Policy 2010 have been defined in the light of these contemplations. The curriculum for primary education has been revised to develop a child on the potentials of his/her innate amazement, unbounded curiosity, endless joy and enthusiasm keeping in view the all-round development of children's potentials. The aims and objectives of primary education were modified in the revised curriculum of 2011.

The subject **Mathematics** is abstract one . For easy presentation of the complex terms, there are so many explanations, pictures and examples have been introduced. To create interest and for easy learning of the students "Do yourself with examples" are incorporated here. To evaluate acquired learning outcomes, sufficient exercises have been incorporated in the textbook . On the other hand, the contents of the textbook have been rearranged by following manner 'Easy to Hard' to keep students enthusiastic in the learning strategy.

To make the young learners interested, enthusiastic and dedicated, Bangladesh Awami League Government under the dynamic leadership of the Honorable Prime Minister Sheikh Hasina has taken initiatives to change the textbooks into four colors, and make them interesting, sustainable and distributed free of cost since 2009. The textbooks of Pre-primary, Primary, Secondary, Ibtedaie, Dakhil, Dakhil Vocational and SSC Vocational level are being distributed free of cost across the country which is a historical initiative of the present government.

My sincere acknowledgement and thanks to all who had helped in different stages of composition, edition, rational evaluation, printing and publication of the textbook. Though all cares have been taken by those concerned, the book may contain some errors/lapses. Therefore, any constructive and rational suggestions will be highly appreciated for further improvement and enrichment of the book. We will deem all our efforts successful if the young learners for whom it is intended find it useful to them.

Professor Narayan Chandra Saha
Chairman
National Curriculum and Textbook Board, Bangladesh

Explanation of Characters and Symbols:

1) Character: A dialogue between two students named Reza and Meena are shown in the textbook. The mathematical concept of the students would be clear through their discussion and opinion.

Reza

Mina

2) The steps have been indicated by using some symbols in the lesson.

Key Question: Key concept of the chapter has been expressed through this question.

Activity: To solve a problem students will discuss and think logically with the help of teacher.

Exercise: Students will solve the problems. Progress of learning can also be assessed.

Contents

Chapter One

Large numbers and Place Value

How do we count, read and write large numbers?

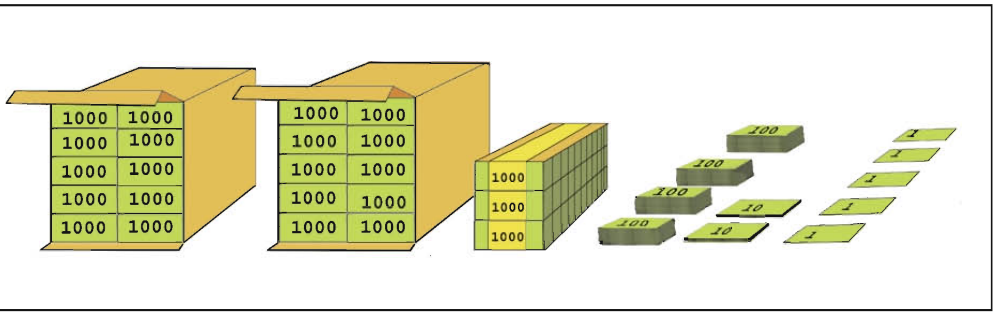
Let's think how do we count large number.

Why don't we make groups of ten, hundred and thousand as we learned in Grade 2 and 3?

1.1 Five digit numbers

These are tickets to sell for a cricket match.

1. How many packages does the box have inside?
2. How many are there in total?



1000	1000
1000	1000
1000	1000
1000	1000
1000	1000

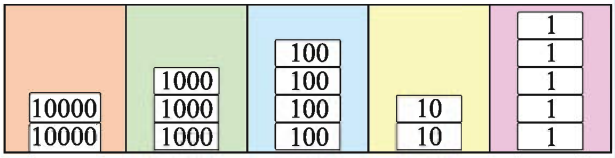
= 10000 ten thousand.

The box has 10 packages of 1000. It means the box has "1000 times 10" tickets. This amount is called **ten thousand** and is written as **10000**. There are 2 ten thousands, so it is called **twenty thousand**.

And we have 3425 more tickets, so the total is…

The total is: **23425**

And this new place is called **ajut**.



Name of the Place	**ajuts**	thousands	hundreds	tens	ones
	2	**3**	**4**	**2**	**5**
	twenty-three thousand		four hundred	twenty-five	

We read **23425**as:

"twenty-tree thousand four hundred and twenty-five."

2 3 4 2 5

- 5 ones — 5
- 2 tens — 20
- 4 hundreds — 400
- 3 thousands — 3000
- 2 ajut — 23 thousands — 20000

Read aloud, write in words and show place value like above and the example below.

(1) 23517 (2)50326 (3) 93005

[Example]31024 "Thirty-one thousand and twenty-four"

3 1 0 2 4

- 4 ones — 4
- 2 tens — 20
- 0 hundreds — 0
- 1 thousands — 1000
- 3 ajuts — 31 thousands — 30000

Write in figures.

(1) fifty-seven thousand three hundred and sixty-three
(2) thirty thousand six hundred and five
(3) eighty-six thousand and two
(4) the number made of 4 ten thousands and 9 thousands
(5) the number made of 6 ten thousands, 7 thousands and 5 tens

1.2 Six, Seven and Eight digit numbers

137109

This is the number of a newly registered motor vehicles in Bangladesh in 2013. How do you read it?

It's easy! Let's make groups of ten, hundred thousand and ten thousand as we did before.

Wait! I don't think it's so easy... because there aren't enough places.

	ajuts	thousands	hundreds	tens	ones
1	3	7	1	0	9

You need to know a new place named **lacs**.
1 **lac** is **10 ajut** and written as **100000**

Name of the Place

lacs	ajuts	thousands	hundreds	tens	ones
1	3	7	1	0	9
one lac	thirty-seven thousand		one hundred	nine	

We read **137109** as:
"one lac thirty-seven thousand one hundred and nine."

1 3 7 1 0 9

- 9 ones — 9
- 0 tens — 0
- 1 hundreds — 100
- 7 thousands — 7000
- 3 ajuts — 30000 (7 thousands + 3 ajuts = 37 thousands)
- 1 lacs — 100000

1 Read the numbers aloud, write in words and show place value.

(1) 894312 (2) 360518 (3) 730084 (4) 2463751

Challenge!

Reza, are you able to guess how to read **2463751,** in (4)?

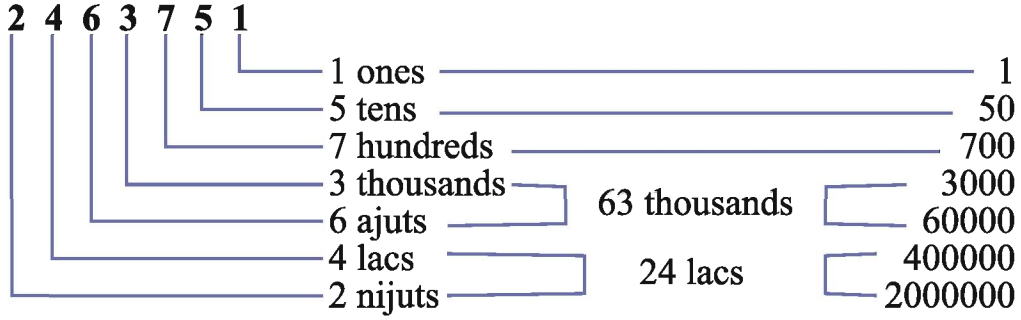
Another place is needed, and I think the number which comes to this place is called ten…lacs…?

As Reza guess, **ten lacs** comes for this place.
1 **ten lac** is written as **1000000**

And this new place is called **nijut.**

Name of the Place	**nijuts**	**lacs**	**ajuts**	thousands	hundreds	tens	ones
	2	4	6	3	7	5	1
	twenty-four lac		sixty-three thousand		seven hundred	fifty-nione	

We read **2463751** as:
"twenty-four lac sixty-three thousand seven hundred and fifty-one."



One nijut (ten lacs) is called "one million" as well.

2 Read aloud and write in words. Show their place value like above.

(1) 4123476 (2) 6871035 (3) 5609320 (4) 1111111

3 Write in figures.

(1) five lac seventy-three thousand six hundred and thirty four
(2) thirty one lac forty five thousand nine hundred and thirty six.
(3) ninety nine lac ninety nine thousand nine hundred and ninety nine
(4) the number made of 7 lacs and 3 ten thousands
(5) the number made of 4 ten lacs 8 thousands 3 hundreds

19584972 was the number of students in Primary Education in Bangladesh in 2013. How do you read it?

So many! I am one of them!

It seems that we need another place again.

We use **crore** for this new place.
1 **crore** is **10 nijut**, and written as **10000000**.

Name of the Place	**crores**	**nijuts**	**lacs**	**ajuts**	thousands	hundreds	tens	ones
	1	9	5	8	4	9	7	2
	one crore	ninety-five lac		eighty-four thousand		nine hundred	seventy-two	

Weread **19584972** as:
"one crore ninety-five lac eighty-four thousand nine hundredand seventy-two."

1 9 5 8 4 9 7 2

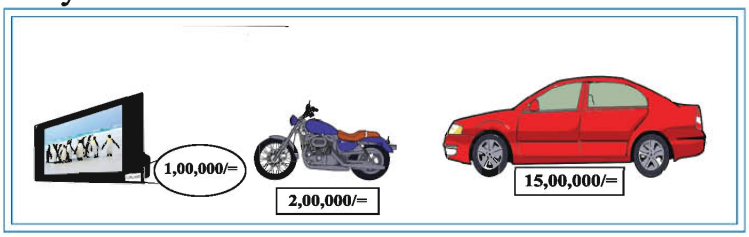
- 2 ones — 2
- 7 tens — 70
- 9 hundreds — 900
- 4 thousands — 4000
- 8 ajuts — 80000 — (84 thousands)
- 5 lacs — 500000
- 9 nijuts — 9000000 — (95 lacs)
- 1 crores — 10000000

1. Read aloud, write in words and show place value like above.
   (1) 19584972 (2) 25007024

2. Write in figures.
   (1) one crore twelve lac thirteen thousand six hundred and eighteen
   (2) two crore two lac two thousand two

Use of "comma"

As you might have been found, we often have difficulty in counting large numbers. So we use "comma" to read the figures of the number easily.



How to put **comma**

[Example]

7	,	5	3	,	6	5	,	7	8	0

2 digits | 2 digits | 3 digits

crores		nijuts	lacs		ajuts	thousands		hundreds	tens	ones
7	,	5	3	,	6	5	,	7	8	0
seven crore		fifty-three lac			sixty-five thousand			seven hundred	eighty	

Each comma comes after the place of **thousands**, **lacs** and **crores**.

It makes easy to understand the places of numbers.

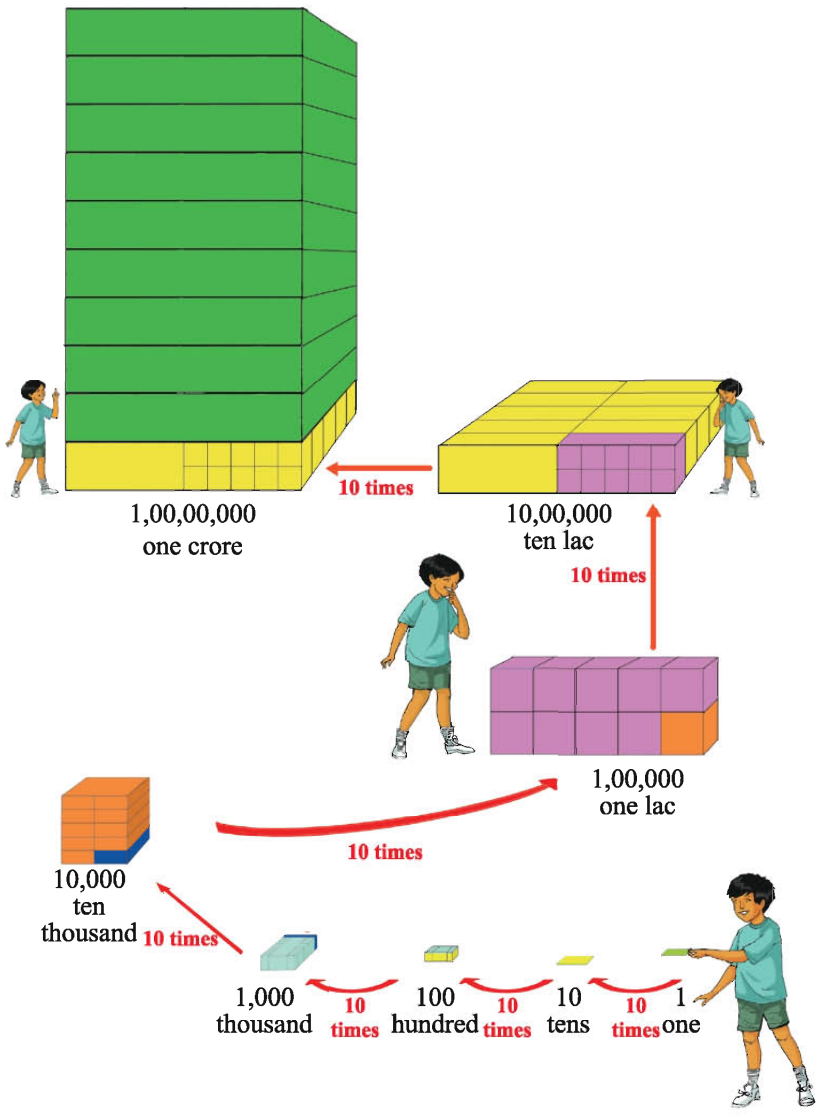
5 Put commas at the right place on the number and read them aloud.

(1) 98784689 (2) 6825712 (3) 130405

(4) 70004 (5) 2171 (6) 44444444

Let's summarise number system for larger ones.

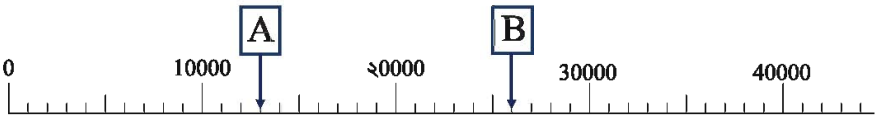
Explain this picture.



(1) How many times larger is ten thousand than one thousand?
(2) How many times larger is one lac than ten thousand?
(3) How many times larger is one crore than ten lac?

1.3 Number Line

What numbers are presented for A and B on the number line?



Number line is very useful to know the numerical sequence and larger-smaller relation between numbers!

The numbers increase as you go to the right on the number line. And we must aware of the each interval of the scale.

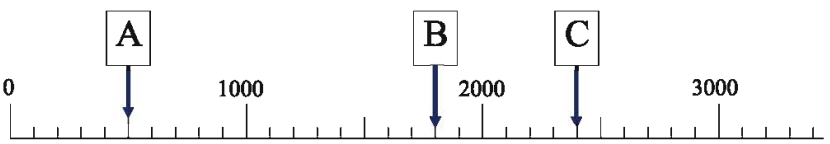
In this case, each interval of the scale is 1000!

A is 3 intervals after 10000 : **10000** + 3000 = ☐

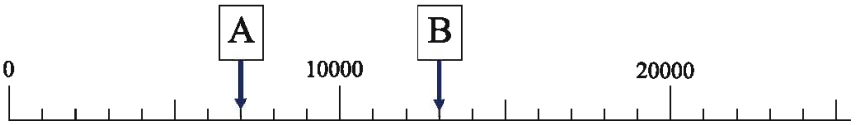
B is 6 intervals after 20000 : **20000** + 6000 = ☐

Write the numbers that correspond with A, B and C positions.

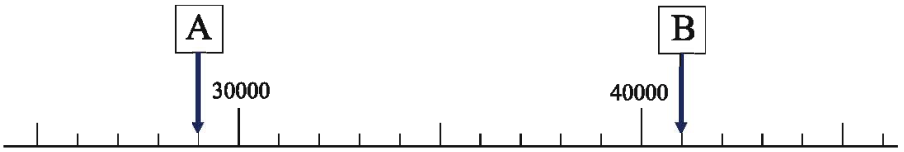
(1)



(2)

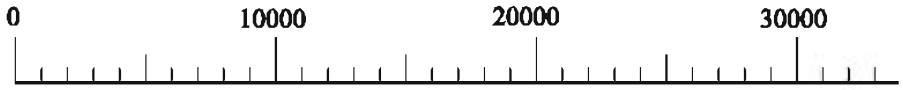


(3)



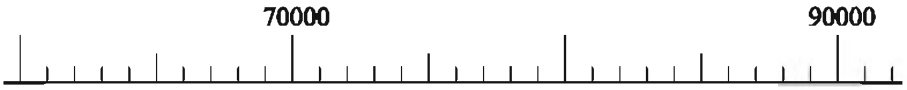
2 Present these numbers on the number line.

(1) 4000, 16000, 29000



(2) 30000, 300000

(3) 72000, 80000, 89000



1.4 Exercise (1)

1. Read aloud, write in words and show place value.

(1) 872931 (2) 5178572 (3) 13572468 (4) 1010101

2. Write these numbers in both figures and words.

(1) The number made of 45 thousands

(2) The number made of 100 lacs

(3) The number made of 1000 thousands

(4) The number made of 127 thousands

(5) The number made of 10 lacs, 10 thousands, 10 hundred and 10

You should make place value table on your notebook and think about them.

crores	nijuts	lacs	ajuts	thousands	hundreds	tens	ones

3. Read these numbers aloud and put the digit at the right place like the example .

(Ex.) 48639

nijuts	
lacs	
ajuts	4
thousands	8
hundreds	6
tens	3
ones	9

(1) 402537

nijuts	
lacs	
ajuts	
thousands	
hundreds	
tens	
ones	

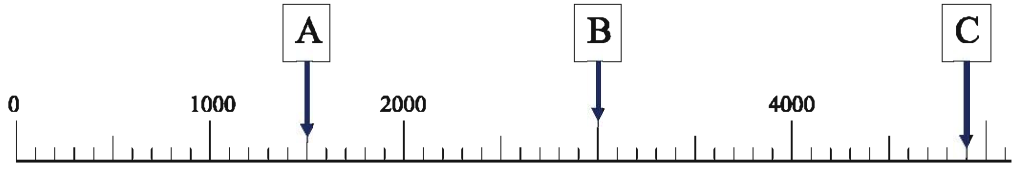
(2) 7080399

nijuts	
lacs	
ajuts	
thousands	
hundreds	
tens	
ones	

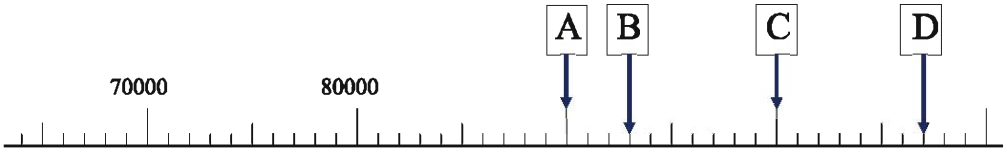
4. Put comma appropriately.

(1) 13524689 (2) 9757834 (3) 55555555

5. (1) Put the numbers at (A) to (C) position.



(2) Put the numbers at (A) to (D)



1.5 Comparison of numbers

Which number is larger?

Which is larger, 38000 or 36000?

I remember we learned comparison of four-digit numbers in Grade 3

Which should we compare from, the biggest place or the smallest place?

We compare from the biggest place to the smallest one by one.

Ajuts are the same.

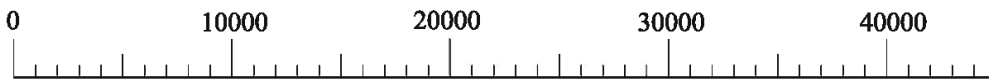
In thousand place, 8 is larger than 6.

3	8	0	0	0
3	6	0	0	0

So 38000 is larger than 36000.

38000 > 36000

Let's check 38000 and 36000 on the number line.



1 Compare the following numbers and fill blanks with "<" or ">".

(A) 9530 ☐ 9628 (B) 24800 ☐ 23900

(C) 75000 ☐ 80000 (D) 465311 ☐ 465211

Which is larger, **39000** or **371020** ?

Let's compare the digits from the biggest place to the smallest! So I think 39000 is larger than 371020.

Wait! We sometimes misread large numbers. Let's put the numbers on the place properly or put comma.

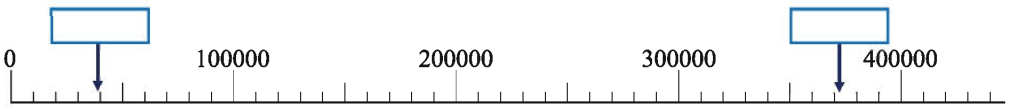
	3	9	0	0	0
3	7	1	0	2	0

39,000 3,71,020

Wow! The number of digits are different! 371020 is evidentially greater than 39000!

39000 < 371020

Let's identify numbers on the number line to compare their numerical size.



The way of Comparison of Numbers

1. Compare the number of digits.
   The number consisting of more digits is larger.
2. When the number of digits are the same:
(1) Compare the biggest place.
   The number which has bigger number is larger.
(2) If they are the same, compare the second biggest place, and repeat this comparison to the smaller digit until you find the difference.
(3) If all digits are the same, these two numbers are the same.

2 Compare the following numbers and write "<"or ">" in boxes.

(1) 87526 ☐ 141632 (2) 9999 ☐ 44444

(3) 4467322 ☐ 464499 (4) 1000456 ☐ 1000465

Sakib wants to buy a bicycle and finds different prices in different shops. They are taka 5238, taka 7329, taka 8324, taka 6137 and taka 7325.
Which one is cheaper and which one is more expensive? Arrange these numbers from smaller number to greater sequentially and show it by symbols.

5238 7329 8324 6137 7325

Well, all are four digit numbers. So let's begin with comparing the biggest place.

How about putting comma to clarify the places?

I'll put them vertically in order to compare the numerical size.

5,238 7,329 8,324 6,137 7,325

5	2	3	8
7	3	2	9
8	3	2	4
6	1	3	7
7	3	2	5

What is the smallest number?
What is the second smallest number?

By observing the numbers with the place value, we get:

5238 < 6137 < 7325 < 7329 < 8324

smallest largest

We can also arrange these numbers from largest to smallest.

8324 > 7329 > 7325 > 6137 > 5238

So which price should Sakib prefer?

3 Arrange the following numbers serially from smaller to greater and from greater to smaller and show by symbols.

98427, 56789, 603245, 791345, 6750283, 97653, 891498

Firstly, it would be better to put them vertically, and compare them.

Which is more convenient, putting comma or putting numbers vertically?

Smaller to greater:

□ < □ < □ < □ < □ < □ < □

Greater to smaller

□ > □ > □ > □ > □ > □ > □

5 Prepare four number cards as the following picture four number cards and make four digit numbers as many as possible with them. And write all of them down on your note book.

By moving cards, let's find the numbers.

7	4	9	1
9	7	1	4
1	9	4	7

7	4	9	1

What is the largest number that you can make with these four cards?
And what is the smallest number that you can make with them?

The largest number is: 9741
The smallest number is: 1479

Are there any rules to make the largest or the smallest numbers?

Let's exchange our opinions about it and find the rules.

Imagine that you have following five number cards and make five digit numbers with them.

8	5	0	2	7

(1) Using all five cards, make the largest five digit number possible.
(2) Using all five cards, make the smallest five digit number possible.

We must be careful about use of "0"

Oh, that's right. "0" cannot be come to all the places.

The largest number is: 87520
The smallest number is: 20578

Let's listen to the opinions of other students, exchange our opinions about it and find the rules.

Rita

To make the largest number, we put the highest digit at the beginning, and put the second highest digit at the second place.

Yes, yes. And as a result, the digits are arranged from larger to smaller. 9741 → 87520

Sohel

Sima

On the other hand, to make the smallest number, we put the smallest digit at the beginning, and the second smallest digit in the second place... as a result, the digits are arranged from smaller to larger. 1479

But, we must be careful about "0". Even though "0" is the smallest digit, it cannot be put at the beginning of the number because no number begins with "0". So we have to put "0" at the second place instead of beginning.

× 02578 ✓ 20578

Sobuj

We have found some important rules of the structure of numbers.

You have following six number cards and make six digit numbers with all of them.

0	1	3	4	7	9

Oh, what were odd number and even number…?

Challenge!

(1) Find the largest number possible.
(2) Find the smallest number possible.
(3) Find the largest **odd** number possible.
(4) Find the smallest **even** number possible.

Find the largest and smallest number in every digit number up to six-digit number and share with your friends about what you notice.

	largest	smallest
one-digit number		1
two-digit number		
three-digit number		
four-digit number		
five-digit number		
six-digit number		

In this case 0 isn't be regarded as one-digit number because it is mathematically very special.

(1) What is the number next to 999?
(2) What is the number before 10000?

1.7 Exercise(2)

1. Compare the following numbers and write "<", ">" or "=".

(1) 8499 ☐ 8511 (2) 11100 ☐ 11001

(3) 289999 ☐ 290001 (4) 2222221 ☐ 2222223

(5) 1011001 ☐ 1011001 (6) 5555555 ☐ 555555

2. You have following six number cards and make six digit numbers with all of them.

(1) Find the largest number possible.

(2) Find the smallest number possible.

(3) Find the largest **odd** number possible.

(4) Find the smallest **odd** number possible.

3. This is the list of the population of some cities. Arrange these numbers from smaller number to larger sequentially and answer which city has the largest population and which has the smallest.

Name of the city	Population
A	371993
B	2456891
C	3704231
D	4589476
E	886397

Chapter Two

Addition and Subtraction

2.1 Addition upto four digit numbers

Do addition.

(1) 232 + 334

(2) 1325 + 3522

(3)
$$\begin{array}{r} 253 \\ +526 \\ \hline \end{array}$$

(4)
$$\begin{array}{r} 1538 \\ +3421 \\ \hline \end{array}$$

(5)
$$\begin{array}{r} 1231 \\ 103 \\ +6254 \\ \hline \end{array}$$

(6)
$$\begin{array}{r} 1402 \\ 3056 \\ 210 \\ +3120 \\ \hline \end{array}$$

(7) 116 + 228

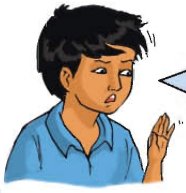
(8) 2416 + 1375

(9)
$$\begin{array}{r} 364 \\ +472 \\ \hline \end{array}$$

(10)
$$\begin{array}{r} 1538 \\ +3625 \\ \hline \end{array}$$

(11)
$$\begin{array}{r} 4391 \\ 1584 \\ +3625 \\ \hline \end{array}$$

(12)
$$\begin{array}{r} 148 \\ 1275 \\ 2151 \\ +1362 \\ \hline \end{array}$$



We add ones place first and add tens, hundreds and thousands in order, don't we?

Yes, and recall how to carry the numbers.

$$\begin{array}{r} {\scriptstyle 1\ \ 2\ \ 1\ \ } \\ 1373 \\ 4584 \\ +3655 \\ \hline 9612 \end{array}$$

ones place 3 + 4 + 5 = 12

tens place 7 + 8 + 5 + 1 = 21

hundreds place 3 + 5 + 6 + 2 = 16

thuosands place 1 + 4 + 3 + 1 = 9

2.2 Additionup to five digit numbers

Let's try addition with larger numbers.

1 In a city there live 45736 females and 48797 males. How many people are there in total?

We'll find the total amount, so the operation must be ☐.

Mathmatical sentence is: **45736 + 48797** ☐

Let's put them up-down and add them.

ones place	6 + 7		= 13
tens place	3 + 9	+ 1	= 13
hundreds place	7 + 7	+ 1	= 15
thuosands place	5 + 8	+ 1	= 14
ajuts place	4 + 4	+ 1	= 9

```
  1 1 1 1
  4 5 7 3 6
+ 4 8 7 9 7
  9 4 5 3 3
```

Even though the numbers are bigger, the way of addition is the same as we studied in grade 3!

The total number is: **94533**

1 Do addition.

(1)
```
  1 3 5 6 7
+ 4 3 1 2 1
```

(2)
```
  2 2 6 4 3
+   1 7 2 5
```

(3)
```
  2 3 5 1 4
+ 1 5 6 2 7
```

(4)
```
  1 3 1 3 7
+ 1 8 6 7 2
```

(5)
```
  2 2 6 7 9
+ 5 7 1 2 2
```

(6)
```
  2 3 8 3 6
+ 4 1 4 8 9
```

(7)
```
  4 3 7 5 6
+ 3 7 2 7 5
```

(8)
```
  9 9 9 9 9
+         1
```

2 The following table lists the sales of a candy shop. How much is the total sales from January to May?

January	Tk.34295
February	Tk.13720
March	Tk.14853
April	Tk.20582
May	Tk.12376

We are answering total amount, so the operation must be ☐ .

Mathmatical sentence is: **34295 + 13720 + 14853 + 20582 + 12376**

1 2 3 1

3 4 2 9 5
1 3 7 2 0
1 4 8 5 3
2 0 5 8 2
+ 1 2 3 7 6
9 5 8 2 6

ones place $5 + 0 + 3 + 2 + 6 = 16$

tens place $9 + 2 + 5 + 8 + 7 \ (+1) = 32$

hundreds place $2 + 7 + 8 + 5 + 3 \ (+3) = 28$

thuosands place $4 + 3 + 4 + 0 + 2 \ (+2) = 15$

ajuts place $3 + 1 + 1 + 2 + 1 \ (+1) = 9$

The total is Tk. **95826**

The way of addition is basically the same. But carried numbers become larger.

2 Do addition.

(1)
3 1 2 3
1 4 3 4
+ 4 2 7 2

(2)
5 3 6 4
2 1 0 3
1 1 3 4
+ 3 2 2 5

(3)
1 0 8 2
1 8 3
1 4 2 7
+ 6 2 1 4

(4)
1 3 9 2 1
1 2 5 0 3
3 3 5 5 5
1 1 5 0 2
+ 2 0 5 1 6

Now, we can do the vertical calculations of big numbers.

3 Do addition.

(1) 1112 + 2221 + 3232 + 2222 (2) 50000 + 4000 + 300 + 20 + 1

(3) 123 + 321 + 4000 + 2222 + 3333

(4) 12311 + 21022 + 11111 + 22222 + 21212

(5)
```
  2513
  1242
 +5234
------
```

(6)
```
  1432
  2104
  1735
 +2621
------
```

(7)
```
  1232
   103
   328
 +6254
------
```

(8)
```
  1402
  3050
  4637
  2210
 +3126
------
```

(9)
```
   329
 +54672
-------
```

(10)
```
  54827
+  2654
-------
```

(11)
```
  43454
+37647
-------
```

(12)
```
  99999
+     1
-------
```

(13)
```
  40305
  15246
 +30837
-------
```

(14)
```
  25302
   3514
    236
 +34005
-------
```

(15)
```
  24173
   6234
   2558
+  3424
-------
```

(16)
```
  32724
   9063
  12626
  21151
 +13312
-------
```

(17)
```
  32732
   4328
  64350
   2235
+  2827
-------
```

(18)
```
  13787
  27253
  23856
  16154
 +16353
-------
```

(19)
```
  21564
  18602
  25678
  21913
 +12243
-------
```

(20)
```
   9999
  18999
  17999
  19999
 +29999
-------
```

In case you add with sidewise calculation, you also add one by one from ones place to larger places. Then putting " ´ " mark on the top of calculated digit is useful.

Let's do the example.

13421 + 2534 + 40432 + 22020 + 12141

(1) ones place

1 + 4 + 2 + 0 + 1 = 8

$13421' + 2534' + 40432' + 22020' + 12141'$ = | | | | | 8 |

(2) tens place

In case there is carrying, add to the next place.

$13421' + 2534' + 40432' + 22020' + 12141'$ = | | | ^{1} | 4 | 8 |

(3) hundreds place

$13421' + 2534' + 40432' + 22020' + 12141'$ = | | ^{1} | 5 | 4 | 8 |

Try to calculate the continuance.

(4) thousands place

$13421' + 2534' + 40432' + 22020' + 12141'$ = | | | 5 | 4 | 8 |

(5) ajuts place

$13421' + 2534' + 40432' + 22020' + 12141'$ = | | | 5 | 4 | 8 |

Do addition with sidewise calculation.

(1) 3242 + 1305 + 132 + 1310

(2) 2150 + 3518 + 1310 + 1314 + 1101

(3) 24163 + 10425 + 14203 + 2340 + 16025

(4) 21403 + 14130 + 10137 + 19025 + 21025

Challenge!

5 Try to make free calculations with some five-digit numbers of which sum is 100000.

[1st step] with two numbers

+					
1	0	0	0	0	0

How can I do it? It seems difficult…

Start with ones place. And make 10 in each place including carried number.

[example]

	2	0	0	0	0
+	8	0	0	0	0
1	0	0	0	0	0

	1	9	9	9	0
+	8	0	0	1	0
1	0	0	0	0	0

	1	4	2	5	2
+	8	5	7	4	8
1	0	0	0	0	0

[2nd step] with three numbers [example]

+					
1	0	0	0	0	0

	3	3	3	3	4
	3	3	3	3	3
+	3	3	3	3	3
1	0	0	0	0	0

	1	2	3	4	5
	5	9	4	1	2
+	2	8	2	4	3
1	0	0	0	0	0

[3rd step] with more numbers [example]

+					
1	0	0	0	0	0

	2	6	3	9	1
	3	2	5	8	2
	1	9	5	2	3
+	2	1	5	0	4
1	0	0	0	0	0

	3	1	8	6	5
	2	1	8	6	5
	1	2	8	6	5
	1	1	8	6	5
+	2	1	5	4	0
1	0	0	0	0	0

2.3 Subtraction up to four digit numbers

Do subtraction.

(1) $230 - 110$ (2) $730 - 210$ (3) $6760 - 4650$

(4)
$$\begin{array}{r} 597 \\ -\ 397 \\ \hline \end{array}$$

(5)
$$\begin{array}{r} 987 \\ -\ 450 \\ \hline \end{array}$$

(6)
$$\begin{array}{r} 2568 \\ -\ \ 105 \\ \hline \end{array}$$

(7)
$$\begin{array}{r} 7586 \\ -\ 3215 \\ \hline \end{array}$$

(8) $150 - 70$ (9) $530 - 90$ (10) $455 - 265$

(11)
$$\begin{array}{r} 540 \\ -\ 280 \\ \hline \end{array}$$

(12)
$$\begin{array}{r} 453 \\ -\ \ 76 \\ \hline \end{array}$$

(13)
$$\begin{array}{r} 3600 \\ -\ 521 \\ \hline \end{array}$$

(14)
$$\begin{array}{r} 8302 \\ -\ 4797 \\ \hline \end{array}$$

Let's review how to do the subtraction with 3-digit numbers. We calculate ones place first and subtract in order.

Yes. But be careful about"moving the number."

$$\begin{array}{r} {\scriptstyle 3\ \ 10} \\ 6\,\not{4}\,2 \\ -\ 3\,6\,8 \\ \hline \qquad 4 \end{array}$$

[Ones place] 12 − 8 = 4
We cannot do subtract 8 from 2, so move 1 ten (=10 ones) from tens place to ones place and subtract 8 from 12.

$$\begin{array}{r} {\scriptstyle 10} \\ {\scriptstyle 5\ \ 3} \\ 6\,\not{4}\,2 \\ -\ 3\,6\,8 \\ \hline \qquad 7\,4 \end{array}$$

[Tens place] 13 − 6 = 7
We cannot do subtract 6 from 3, so move 1 hundred (=10 tens) from hundreds place to tens place and subtract 6 from 13.

$$\begin{array}{r} {\scriptstyle 5} \\ \not{6}\,4\,2 \\ -\ 3\,6\,8 \\ \hline 2\,7\,4 \end{array}$$

[Hundreds place] 5 − 3 = 2

2.4 Subtraction with five-digit numbers

The spectators of yesterday's football match were 47543 people and today's spectators are 50238 people. What's the difference?

As we have to find difference, the operation should be ____ .

We subtract smaller number from bigger number.

Mathmatical sentence is: **50238 − 47543**

```
  5 0 2 3 8
− 4 7 5 4 3
-----------
          5
```

[Ones place] $8 - 3 = 5$

```
      1 10
  5 0 2 3 8
− 4 7 5 4 3
-----------
        9 5
```

[Tens place] $13 - 4 = 9$
We cannot do subtract 4 from 3, so move 1 hundred (=10 tens) from hundreds place to tens place and subtract.

```
     10
  4 9 1
  5 0 2 3 8
− 4 7 5 4 3
-----------
      6 9 5
```

[Hundreds place] $11 - 5 = 6$
We cannot do subtract 5 from 1, so we need to move 1 thousand (=10 hundred) from thousands place to hundreds place, but thousands place is 0. So we have to move1 ajut (10 thousand) and to thousands place then move 1 thousand .

```
    4 9
  5 0 2 3 8
− 4 7 5 4 3
-----------
    2 6 9 5
```

[Thousands place] $9 - 7 = 2$
We have moved 1 ajut (=10 thousand) to thousands place and moved 1 thousand to hundreds place, so we have 9 in this place.

```
    4
  5 0 2 3 8
− 4 7 5 4 3
-----------
    2 6 9 5
```

[ajuts place] $4 - 4 = 0$
When the largest place is 0, we don't need to put 0.

The difference is: 2695 people
(Today's spectators are more than yesterday.)

2 An author printed 10000 books, but printing error was found in 54 books and cannot be sold. How many books can he sell?

It's a problem for a remainder, so the operation is [ ].

Mathmatical sentence is: **10000 − 54**

```
   ? ? ? 10
  1 0 0 0 0
−       5 4
```

[Ones place]
We cannot subtract 4 from 0, so we need to move 1 ten (=10 ones) from tens place to ones place, but tens place is 0. So we have to move 10 tens from hundred place, but that place is also 0. Besides thousand place is also 0….

Oh, no! How can we do, then?

Let's think about it with the picture chart.

ajuts	thousands	hundreds	tens	ones
1	0	0	0	0
10000				
	1000 1000 1000 1000 1000 1000 1000 1000 1000 1000			
	1000 1000 1000 1000 1000 1000 1000 1000 1000	100 100 100 100 100 100 100 100 100 100		
	1000 1000 1000 1000 1000 1000 1000 1000 1000	100 100 100 100 100 100 100 100 100	10 10 10 10 10 10 10 10 10 10	
	1000 1000 1000 1000 1000 1000 1000 1000 1000	100 100 100 100 100 100 100 100 100	10 10 10 10 10 10 10 10 10	1 1 1 1 1 1 1 1 1
			− 5	4
	9	9	4	6

Wow! We are replacing number from each stage.

$$\begin{array}{r} {\scriptstyle 9\ 9\ 9\ 10} \\ 1\,0\,0\,0\,0 \\ -\quad\ 5\,4 \\ \hline \end{array}$$

Now we can subtract from ones place.

$$\begin{array}{r} {\scriptstyle 9\ 9\ 9\ 10} \\ 1\,0\,0\,0\,0 \\ -\quad\ 5\,4 \\ \hline \qquad\ 6 \end{array}$$

[Ones place] $10 - 4 = 6$

$$\begin{array}{r} {\scriptstyle 9\ 9\ 9} \\ 1\,0\,0\,0\,0 \\ -\quad\ 5\,4 \\ \hline \qquad 4\,6 \end{array}$$

[Tens place] $9 - 5 = 4$

$$\begin{array}{r} {\scriptstyle 9\ 9} \\ 1\,0\,0\,0\,0 \\ -\quad\ 5\,4 \\ \hline \qquad 9\,4\,6 \end{array}$$

[Hundreds place]
No subtraction.
(or $9 - 0 = 9$)

$$\begin{array}{r} {\scriptstyle 9} \\ 1\,0\,0\,0\,0 \\ -\quad\ 5\,4 \\ \hline \qquad 9\,9\,4\,6 \end{array}$$

[Thousands place]
No subtraction.
(or $9 - 0 = 9$)

He is able to sell **9946** books

Do subtraction:

(1) $\begin{array}{r} 1\,0\,0\,0\,0 \\ -\quad\ 1 \\ \hline \end{array}$ (2) $\begin{array}{r} 1\,0\,0\,0\,0 \\ -\ 2\,4\,6\,8 \\ \hline \end{array}$ (3) $\begin{array}{r} 1\,0\,0\,0\,0 \\ -\ 9\,9\,9\,9 \\ \hline \end{array}$ (4) $\begin{array}{r} 1\,0\,0\,0\,0\,0 \\ -\quad\ 1 \\ \hline \end{array}$

2 Do subtraction:

(1) 4900 − 3700 (2) 10000 − 8000

(3) 32000 − 12000 (4) 86000 − 85200

(5)
$$\begin{array}{r} 5396 \\ -\ 554 \\ \hline \end{array}$$

(6)
$$\begin{array}{r} 2347 \\ -1164 \\ \hline \end{array}$$

(7)
$$\begin{array}{r} 7129 \\ -3383 \\ \hline \end{array}$$

(8)
$$\begin{array}{r} 8315 \\ -7334 \\ \hline \end{array}$$

(9)
$$\begin{array}{r} 76237 \\ -\ 1571 \\ \hline \end{array}$$

(10)
$$\begin{array}{r} 16847 \\ -\ 1279 \\ \hline \end{array}$$

(11)
$$\begin{array}{r} 76413 \\ -\ 2946 \\ \hline \end{array}$$

(12)
$$\begin{array}{r} 10000 \\ -\ 5900 \\ \hline \end{array}$$

(13)
$$\begin{array}{r} 10000 \\ -\ 7810 \\ \hline \end{array}$$

(14)
$$\begin{array}{r} 10000 \\ -\ \ \ 3 \\ \hline \end{array}$$

(15)
$$\begin{array}{r} 17003 \\ -14096 \\ \hline \end{array}$$

(16)
$$\begin{array}{r} 56004 \\ -51428 \\ \hline \end{array}$$

(17)
$$\begin{array}{r} 95014 \\ -76317 \\ \hline \end{array}$$

(18)
$$\begin{array}{r} 35220 \\ -\ 26241 \\ \hline \end{array}$$

(19)
$$\begin{array}{r} 37152 \\ -\ 19356 \\ \hline \end{array}$$

(20)
$$\begin{array}{r} 100000 \\ -\ \ \ \ 8 \\ \hline \end{array}$$

3 Do subtraction with side wise calculation.

Just like addition, we can subtract the number of larger places from ones place, putting "´" marks on the top of calculated digit and checking the borrowing.
[Example]

$$\overset{5}{\not{6}}\ 3\ \acute{4}\ \overset{4}{\not{5}}\ \acute{3} - 2\ \acute{7}\ \acute{2}\ \acute{4}\ \acute{6} = 3\ 6\ 2\ 0\ 7$$

(1) 47560 − 35550 (2) 54300 − 31400

(3) 74444 − 36363 (4) 100000 − 11111

2.5 Relations of Addition and Subtraction

A school has 5424 students in total. And the number of girls are 2631. How many boys are there?

We are finding one part of the total. So we choose… ☐ .

Mathmatical sentence is : **5424 – 2631**

minuend → 5424

subtrahend → −2631

difference → 2793

(4 13 10)

The answer is: **2793** boys

As we studied in grade 3, minuend, subtrahend and difference have certain relation.

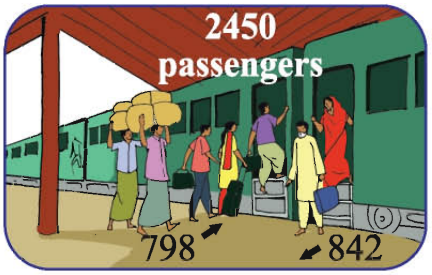
difference	minuend	minuend
+ subtrahend	− subtrahend	− difference
minuend	difference	subtrahend
(boys)+(girls)=(total)	(total)−(girls)=(boys)	(total)−(boys)=(girls)

By using this relationship,we can determine the third if any two of these are given.

Read these two questions related to the previous one and tell the answer.

A school has 2793 boys and 2631 girls. How many students are there in total?	A school has 5324 students in total and has 2793 boys. How many girls are there?

2.6 Problems related to addition and subtraction



There were 2450 passengers in the train. In one station, 842 passengers got off and 798 passengers got on. How many passengers are there in the train now?

"Getting off" should be subtraction and "getting on" should be addition. How can we calculate it?

Mathematical sentence is: **2450 − 842 + 798**

Let's calculate.

$$\begin{array}{r} 2450 \\ -\ 842 \\ \hline \square \end{array} \qquad \begin{array}{r} \square \\ +\ 798 \\ \hline \end{array}$$

Now there are ☐ passengers in the train.

1 Rajib's mother had taka 5580. Before she went to super market, she got taka 3420 from Rajib's father and spend taka 7830 for her shopping. How much taka remains with her?

2 Sum of the present ages of a mother and her daughter is 112 years. 10 years ago, the daughter was 27 years old. What will be the age of the mother after 8 years from now?

(1) 10 years ago, the daughter was 27 years old. How old is she now?
(2) How old is the mother now?
(3) Let's find the age of the mother after 8 years.

Ah… We can solve the question one by one.

It's interesting to find other way to find the answer.

2.6 Exercise

1. Do vertical calculation:

(1)
$$\begin{array}{r} 47258 \\ +\ 21631 \\ \hline \end{array}$$

(2)
$$\begin{array}{r} 23456 \\ +\ 56738 \\ \hline \end{array}$$

(3)
$$\begin{array}{r} 67342 \\ +\ \ 6579 \\ \hline \end{array}$$

(4)
$$\begin{array}{r} 58274 \\ +\ 31726 \\ \hline \end{array}$$

(5)
$$\begin{array}{r} 13242 \\ 34215 \\ +\ 22532 \\ \hline \end{array}$$

(6)
$$\begin{array}{r} 49847 \\ 12142 \\ +\ 18431 \\ \hline \end{array}$$

(7)
$$\begin{array}{r} 14537 \\ 32521 \\ 12512 \\ +\ 23524 \\ \hline \end{array}$$

(8)
$$\begin{array}{r} 17784 \\ 19986 \\ 19123 \\ 19667 \\ +\ 19446 \\ \hline \end{array}$$

(9)
$$\begin{array}{r} 4792 \\ -\ \ 982 \\ \hline \end{array}$$

(10)
$$\begin{array}{r} 34526 \\ -\ \ \ \ \ 8 \\ \hline \end{array}$$

(11)
$$\begin{array}{r} 66842 \\ -\ \ 5933 \\ \hline \end{array}$$

(12)
$$\begin{array}{r} 91276 \\ -89669 \\ \hline \end{array}$$

(13)
$$\begin{array}{r} 87003 \\ -\ \ 6697 \\ \hline \end{array}$$

(14)
$$\begin{array}{r} 40068 \\ -34174 \\ \hline \end{array}$$

(15)
$$\begin{array}{r} 81111 \\ -58889 \\ \hline \end{array}$$

(16)
$$\begin{array}{r} 100000 \\ -\ \ \ \ \ 9 \\ \hline \end{array}$$

2. Do side by side calculation:

(1) 13725 + 16131 + 12142 + 13103
(2) 20000 – 18760

3. Fill in the blanks.

(1) $\square$ − 6483 = 3517
(2) 6874 + $\square$ = 9300
(3) 42700 + 28800 + $\square$ = 100000

4. In a godown there are 8375 sacks of sugar, 11860 sacks of wheat and 12720 sacks of rice. Find the total number of sacks in the godown.

5. Find the number which is 500 bigger than 1543.

6. What is the difference between the largest and smallest numbers formed by the digits 6, 4, 8 and 0 using each digit only once?

7. What number is to be added to 56806, so that their sum will be 64932?

8. Sum of three numbers is 84025. Among them two numbers are 12450 and 37865. What is the third number?

9. Shihab has taka 390 more than that of Gita. And Gita has taka 470 less than that of Shimul. Shimul has taka 890. How much money do Shihab and Gita have?

10. This table shows the number of students of a school. Total number of girls is 3837. How many boys are there in the school?

Class	Number of students (boys and girls)
1	1632
2	1581
3	1543
4	1499
5	1577

11. Sohag thinks about buying a motorcycle by taka 70000. It costs 1500 taka for registration and taka 800 for repairing. If he sells the motor-cycle for taka 90000 how much profit will he get?

12. There are a Banyan tree and a Pine tree in a park. 150 years ago, the sum of the ages of the trees was 2961 years. Now the Pine tree is 1432 years old. What will be the age of the Banyan tree after 200 years?

Chapter Three

Multiplication

3.1 Multiplication with two-three digit numbers

Do multiplication.

(1) 23×3 (2) 17×4 (3) 221×3 (4) 310×4 (5) 286×6

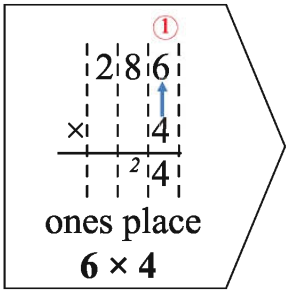
(6) 663×8 (7) 567×3 (8) 306×4 (9) 21×48 (10) 248×32

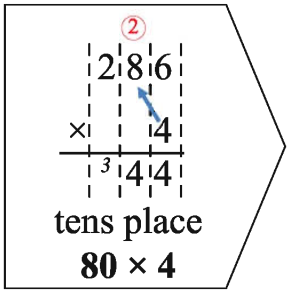
Let's review how to calculate **286 × 4**

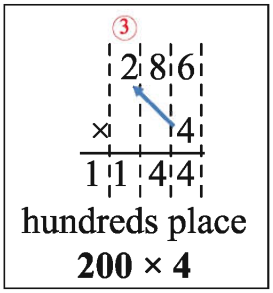
$$\begin{array}{r} 286 \\ \times\ \ 4 \\ \hline 24 \quad 6\times4 \\ 320 \leftarrow 80\times4 \\ 800 \leftarrow 200\times4 \\ \hline 1144 \end{array}$$

Write in one line.

Procedure of the calculation







6×4=24
Put 4 in ones place, and carry 2 in tens place.

8×4=32
Add 2 as carried number. (32+2=34)
This **34** is placed for **34 tens**.

2×4=8
Add 3 as carried number. (8+3=11)
This **11** is placed for **11 hundreds**.

Let's review how to calculate **248 × 32**

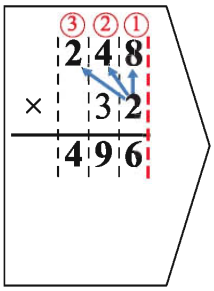
Procedure of the calculation

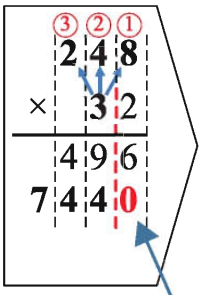
Basic idea

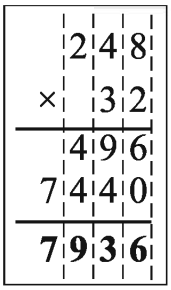
$$\begin{array}{r} 248 \\ \times\ 32 \\ \hline 496 \\ 7440 \\ \hline 7936 \end{array}$$

248 × 2 →

248 × 30 →







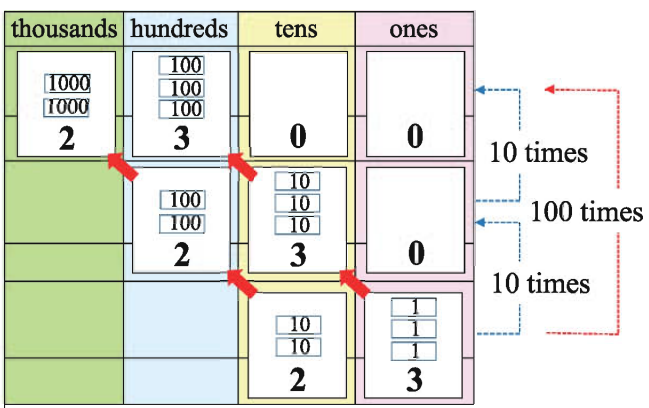
248 × 2 = 496

248 × 30
We regard
248 × 30 as
248 × 3 ×10.

496 + 7440

Put "0" to show that's the calculation for tens place.

Numbers multiplied by 10 and 100



To multiply any number by 10, move all the numbers left one place and put a 0 to the right.

To multiply any number by 100, move all the numbers left two places and put two 0s to the right.

1 Do multiplication.

(1) 5 × 10 (2) 13 × 10 (3) 631 × 10 (4) 100 × 10

(5) 8 × 100 (6) 74 × 100 (7) 987 × 100 (8) 100 × 100

3.2 Multiplication with three-four digit numbers

Let's try to multiply with larger numbers.

There are some Hilsha fish that cost taka 305each. If you buy 53 of them, how much will it cost in all?

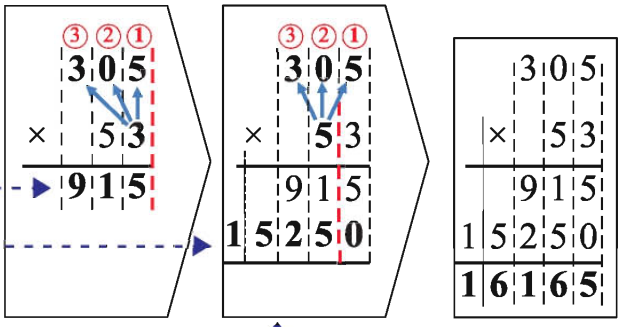
As we know the price of one piece, then we find out the price of several pieces by ☐.

Mathmatical sentence is: **305 × 53**

Procedure of the calculation

305 × 3 ----▶ 915

305 × 50 ----▶ 15250



Total cost is: **taka 16165**.

We regard:
305 × 50 as **305 × 5 ×10**

Do multiplication

(1) 126 × 67

(2) 325 × 28

(3) 567 × 78

(4) 280 × 63

(5) 841 × 60

(6) 891 × 90

(7) 400 × 77

(8) 600 × 89

(9) 500 × 73

(10) 205 × 54

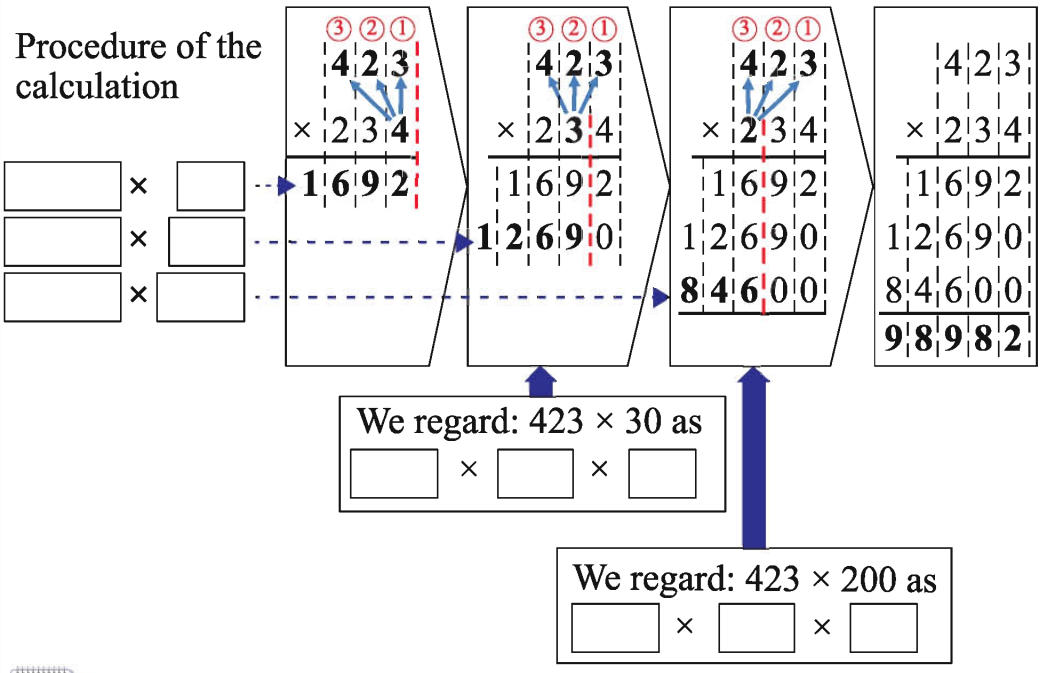
(11) 803 × 35

(12) 705 × 34

Let's explain how to calculate "**three digit × three digit**".

423 × 234

Procedure of the calculation



Do multiplication

(1) 152 × 171

(2) 448 × 141

(3) 398 × 122

(4) 242 × 208

(5) 149 × 617

(6) 123 × 747

(7) 556 × 169

(8) 122 × 125

(9) 501 × 140

(10) 140 × 148

(11) 242 × 244

(12) 698 × 132

Challenge!

(13) 1234 × 56

(14) 3247 × 29

(15) 2015 × 322

(16) 6250 × 16

3 Which way do you think is easier to calculate, (a) or (b)? And explain why?

(a)	(b)
326 × 203 = 978 + 0000 + 65200 = 66178	326 × 203 = 978 + 65200 = 66178

(a)	(b)
138 × 70 = 000 + 9660 = 9660	138 × 70 = 9660

Hmm… (b) looks shorter. What's the difference?

Multiplication of "0" is omitted. It's a good idea. But we must be careful about the places.

3 Do multiplication

(1) 162 × 202 =

(2) 248 × 305 =

(3) 472 × 109 =

(4) 205 × 407 =

(5) 38 × 70 =

(6) 203 × 90 =

(7) 123 × 300 =

(8) 462 × 200 =

Do the vertical calculation for 19 × 267. Compare these two forms and think of which is simpler.

(a)

$$\begin{array}{r} 19 \\ \times\ 267 \\ \hline 133 \\ 114 \\ 38 \\ \hline 5073 \end{array}$$

multiplicand

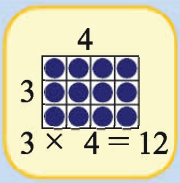
multiplier

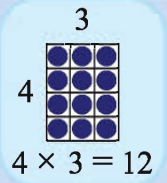
product

(b)

$$\begin{array}{r} 267 \\ \times\ 19 \\ \hline 2403 \\ 267 \\ \hline 5073 \end{array}$$

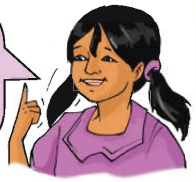
I remember that we can switch the order of the **multiplicand** and **multiplier** and still get same product.





So, we can change 19 × 267 into 267 × 19

As the calculations above show, in vertical calculation, considering smaller digit number as multiplier enables us to calculate easier.



Compare these calculations, and tell the difference.

(a) $\begin{array}{r} 27 \\ \times\ 369 \\ \hline \end{array}$ (b) $\begin{array}{r} 369 \\ \times\ 27 \\ \hline \end{array}$ (c) $\begin{array}{r} 48 \\ \times\ 1273 \\ \hline \end{array}$ (d) $\begin{array}{r} 1273 \\ \times\ 48 \\ \hline \end{array}$

5 Do vertical calculation with the easier way.

(1) 21 × 459 (2) 48 × 273 (3) 54 × 264

(4) 30 × 167 (5) 40 × 178 (6) 2 × 5478

3.3 The simple method

Let's find the simple way to get to answers.

1 Use the fact that "25 ×7 =175" to calculate 2500 × 700.

$$
\begin{array}{ccccc}
25 & \times & 7 & = & 175 \\
\downarrow \times 100 & & & & \downarrow \times 100 \\
2500 & \times & 7 & = & 17500 \quad \times 10000 \\
 & & \downarrow \times 100 & & \downarrow \times 100 \\
2500 & \times & 700 & = & 1750000
\end{array}
$$

$$
\begin{aligned}
& 2500 \times 700 \\
= & \underbrace{25 \times 100}_{} \times \underbrace{7 \times 100}_{} \\
= & \underbrace{25 \times 7}_{} \times \underbrace{100 \times 100}_{} \\
= & \quad 175 \quad \times \quad 10000 \\
= & \quad 1750000
\end{aligned}
$$

Both the results are same! Moreover, they calculate with easy way!

1 Use the fact that "27 × 32 = 864" to find the following answers.

(1) 270 × 320 (2) 2700 × 32 (3) 270 × 3200

Can't we apply this fact to vertical calculation? What do you think?

Then let's try to simplify vertical calculation of 3400×260, using the fact that $34 \times 26 = 884$

$$
\begin{array}{r}
3\,4\,0\,0 \\
\times\ 2\,6\,0 \\
\hline
2\,0\,4 \\
6\,8\,0 \\
\hline
8\,8\,4\,0\,0\,0
\end{array}
$$

100 times

10 times

1000 times

$$
\begin{array}{r}
3\,4 \\
\times\ 2\,6 \\
\hline
2\,0\,4 \\
6\,8 \\
\hline
8\,8\,4
\end{array}
$$

We can consider:

$$
\begin{aligned}
& 3400 \times 260 \\
= & \underbrace{34 \times 100} \times \underbrace{26 \times 10} \\
= & \underbrace{34 \times 26} \times \underbrace{100 \times 10} \\
= & \quad 884 \quad \times \quad 1000
\end{aligned}
$$

In other words, we firstly multiply the numbers without trailing 0. And we secondly put 0 at the end of the product as the same number as the multiplicand and the multiplier have.

Let's compare it with the former way.

$$
\begin{array}{r}
3\,4\,0\,0 \\
\times\quad 2\,6\,0 \\
\hline
2\,0\,4\,0\,0\,0 \\
6\,8\,0\,0\,0\,0 \\
\hline
8\,8\,4\,0\,0\,0
\end{array}
$$

Wow! It has too many 0s and is complicated!

Do vertical calculation with the simple method.

(1) 36×20 (2) 180×14 (3) 23×1700 (4) 130×60

(5) 2630×30 (6) 153×200 (7) 1230×400 (8) 16700×20

3.4 Exercise

1. Do multiplication

(1) 752×10 (2) 100×10 (3) 453×100 (4) 100×100

(5) 145×26 (6) 719×88 (7) 560×63 (8) 928×70

(9) 406×78 (10) 208×30 (11) 137×232 (12) 132×746

(13) 314×209 (14) 449×219 (15) 207×429 (16) 307×203

(17) 1265×34 (18) 3597×24 (19) 2044×41 (20) 4189×21

2. Do vertical calculation with easier way.

(1) 61×256 (2) 34×567 (3) 40×456

(4) 1650×30 (5) 789×200 (6) 1230×200

3. Use the fact that "$48 \times 19 = 912$" to find the following answers.

(1) 480×190 (2) 4800×19 (3) 480×1900

4. Explain where the calculations are wrong. Later calculate them correctly.

(A)
$$\begin{array}{r} 143 \\ \times\ 62 \\ \hline 286 \\ 858 \\ \hline 1144 \end{array}$$

(B)
$$\begin{array}{r} 901 \\ \times\ 83 \\ \hline 273 \\ 728 \\ \hline 7553 \end{array}$$

5. Fill the boxes with appropriate digit :

Challenge!

(1)

$$\begin{array}{r} 2\ 3 \\ \times\ 3\ \square \\ \hline 6\ \square \\ 6\ 9\ 0 \\ \hline 7\ \square\ 9 \end{array}$$

(2)

$$\begin{array}{r} \square\ \square\ 3 \\ \times\quad\ \square \\ \hline 2\ 3\ 7\ 2 \end{array}$$

(3)

$$\begin{array}{r} \square\ 9 \\ \times\quad \square\ \square \\ \hline \square\ 7\ \square \\ \square\ 1\ \square\ 0 \\ \hline \square\ \square\ 4\ 3 \end{array}$$

6. You have 100 notes of "one hundred taka notes". How much money do you have?

7. There are 37 boxes which contain 500 tickets of cricket match. How many tickets are there?

8. Rahima earns taka 125 daily by sewing. How much money does she earn in 25 days?

9. You have fifteen pieces of 230 metres of ropes. If you put them in one line, how long is the total length of the ropes?

10. If you put taka 165 a month in Matir Bank, how much money can you save in one year?

11. Selim sold 185 hens from his poultry farm. He got taka 275 for each hen. How much money did he get in total?

12. 78 pieces of paper is needed to make an exercise book. If you make 955 exercise books, how many pieces of paper will you need?

Chapter Four

Division

4.1 Division by divisor of one-digit number

Do division.

(1) 42 ÷ 7 (2) 57 ÷ 8 (3) 240 ÷ 3 (4) 420 ÷ 5

(5) 4)80((6) 9)73((7) 6)84((8) 5)61(

Let's review how to do division of **93 ÷ 4**

dividend

4) 93 (

divisor

4) 9 3 (**2**

8

1

Just look at tens place of dividend.
Write **2** as a quotient of tens place on the right.
Multiply 4 by 2 and get 8.
Subtract 8 from 9 and get **1**. For tens place
9 ÷ 4 = 2 remainder 1

4) 9 3 (2

8

1 **3**

Bring 3 down.

quotient

4) 9 3 (2 **3**

8

1 3

1 2

1

remainder

Write **3** as a quotient of ones place on the right.
Multiply 4 by 3 and get 12. Subtract 12 from 13 and get **1** as the remainder. For ones place
13 ÷ 4 = 3 remainder 1

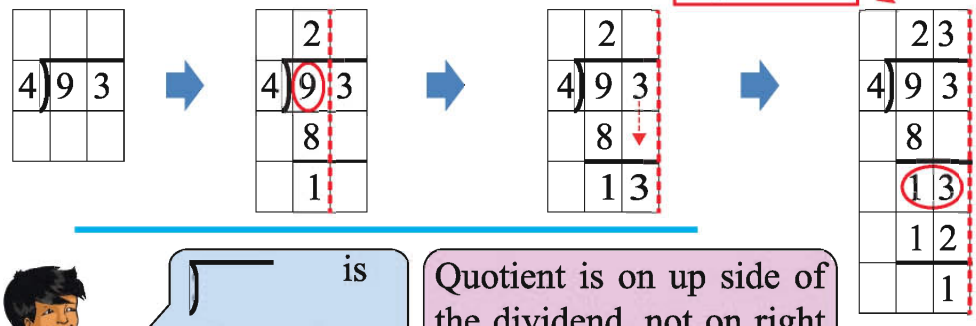
Quotient 23 Remainder 1

We write this as **23 remainder 1.**

This long division has been used in our country and neighbouring countries for many years as a **traditional method**. But we have another method as an **international method**.

Compare following division with the previous one.

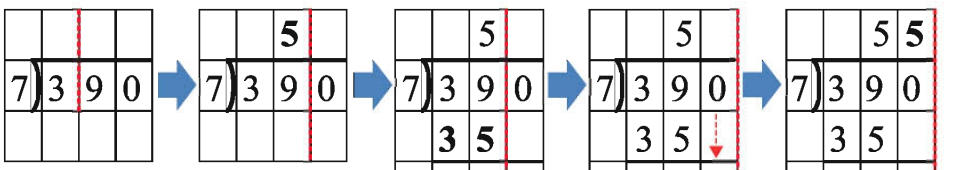
quotient



Quotient is on up side of the dividend, not on right side of it. But the basic process looks like the same.

The basic process is the same but only the position of the quotient is different. As the place of quotient is in accord with that of dividend, we don't have to worry about the place of quotient.
After Grade 4, this method will be adopted as the method of division.

Do the division of 390 ÷ 7 .



We cannot do 3÷7. So move to the tens place.

Now we can do 39÷7. Write **5** as a quotient of tens place on the top.

Multiply 7 by 5 and get **35**. Subtract 35 from 39 and get **4**.

Move to ones place and bring **0** down.

Now we do 40÷7 with the same way.

Quotient 55 remainder 5

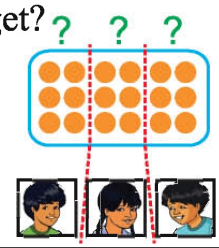
Do the long division of the international method.

(1) 4)80 (2) 9)73 (3) 6)84 (4) 5)63

(5) 6)264 (6) 8)182 (7) 7)819 (8) 3)638

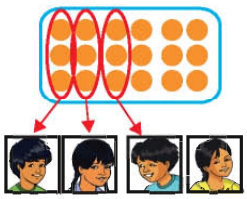
Write a mathmatical sentence and think about in which situation you choose division to solve the problems.

(1) If 18 candies are divided equally among 3 people, how many candies will each person get?



Answer:
6 candies

(2) If 18 candies are distributed so that each person gets 3 candies, how many people can get candies?



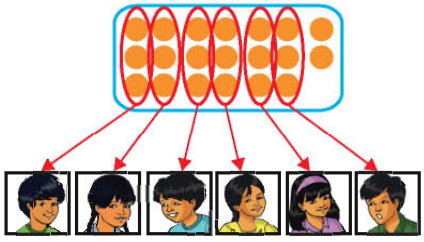
Answer:
6 people

The mathmatical sentences of (1) and (2) are both **18 ÷ 3= 6**. Division is used in the situation of both "**divide equally**" and "**distribute** or **include equally.**"

How to check answers

– Relation between multiplication and division–

If 20 candies are distributed so that each person gets 3 pieces, how many people can get candiesand how many candies will be left?



Mathmatical sentence: **20 ÷ 3 = 6, remainder 2**
Answer: **6 people can get and two candies remain.**

Confirm that if adding the 2 remaining candies to the pooduct of (3×6) makes 20 candies.

20 ÷ 3 = 6 remainder 2 — match

3 × 6 + 2 = 20

divisor × quotient + remainder = dividend

This calculation can be used when you check answers of division.

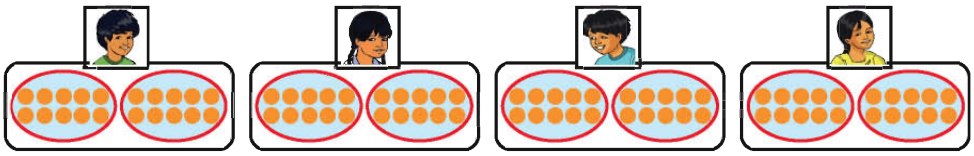
4.2 Division of "three-digit number divided by two-digit"

Let's try division with larger numbers.

You have 80 candies and each 10 candies are in the small bags.
(1) If you distribute your friends by 20 candies each, how many people can get candies?

Mathematical sentence: **80 ÷ 20**

Now let's think about it in terms of small bags.



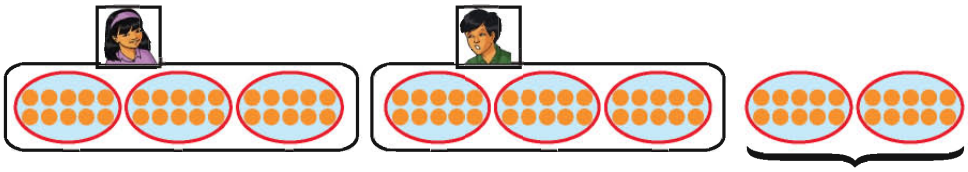
Considering group of 10: **8 ÷ 2**

Oh, we can regard 80 ÷ 20 as 8 ÷ 2 in terms of 10

80 ÷ 20 = 4 Answer: 4 persons.

(2) Then if you distribute your friends 30 candies each, how many can get candies?

Mathmatical sentence: **80 ÷ 30**



Remainder

Considering group of 10: **8 ÷ 3**

80 ÷ 30 = 2 remainder 20

Answer: 2 friends get candies and remain 20 candies

Check the answers in the previous page using the formula:

Divisor × quotient + remainder = dividend

(1) $80 \div 20 = 4$ — Correct. — match

$20 \times 4 = 80$

(2) $80 \div 30 = 2$ **remainder 20** — Correct. — match

$30 \times 2 + 20 = 80$

1 Do division and check the answers.

(1) $90 \div 30$ (2) $80 \div 40$ (3) $120 \div 40$ (4) $240 \div 60$

(5) $420 \div 70$ (6) $400 \div 50$ (7) $50 \div 20$ (8) $80 \div 30$

(9) $120 \div 30$ (10) $210 \div 50$ (11) $390 \div 60$ (12) $500 \div 90$

2 Find the mistake in the calculation below. And find the correct answer.

$190 \div 40 = 4$, **remainder** 3

3 You have 85 candies. If you distribute your friends by 21 candies each, how many people can get candies?

The scene is similar to the previous one.

Mathmatical sentence is: ____

Firstly, let's estimate the quotient.

Think about 85 as 80 and 21 as 20

$85 \div 21$ → $80 \div 20$ → $8 \div 2$

Estimation of the quotient is : $8 \div 2 = 4$

Now, let's think about how to do the long division for $85 \div 21$.

$$21\overline{)85} \quad \Rightarrow \quad \begin{array}{r}4\\21\overline{)85}\end{array} \quad \Rightarrow \quad \begin{array}{r}4\\21\overline{)85}\\84\end{array} \quad \Rightarrow \quad \begin{array}{r}4\\21\overline{)85}\\84\\\hline 1\end{array}$$

1. Look at **tens place** of dividend. But we cannot do $8 \div 21$. So move to **ones place.**

2. Now we can do $85 \div 21$. We write estimated **4** as a quotient on ones place.

3. Multiply 21 by 4 and get 84.

4. Subtract 84 from 85 and get **1** as a **remainder.**

$85 \div 21 = 4$ remainder 1

Each will get 4 candies and remain 1 candy.

Let's do the vertical calculation for $62 \div 31$

We can think about 62 as **60** and 31 as **30.**

$62 \div 31 \Rightarrow 60 \div 30 \Rightarrow 6 \div 3$

Estimation of the quotient is : $6 \div 3 = \mathbf{2}$

$$31\overline{)62} \quad \Rightarrow \quad \begin{array}{r}2\\31\overline{)62}\end{array} \quad \Rightarrow \quad \begin{array}{r}2\\31\overline{)62}\\62\end{array} \quad \Rightarrow \quad \begin{array}{r}2\\31\overline{)62}\\62\\\hline 0\end{array}$$

$62 \div 31 = 2$

3 Do vertical calculation.

$$21\overline{)63} \qquad 11\overline{)66} \qquad 24\overline{)51} \qquad 35\overline{)72}$$

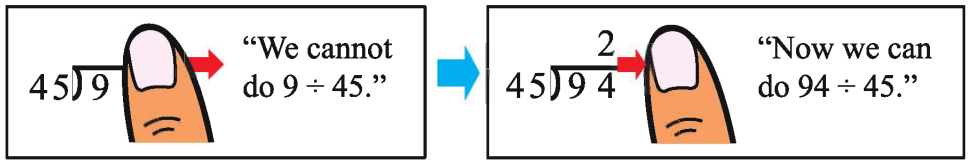
4 Do vertical calculation.

(1) $36 \div 12$ (2) $96 \div 32$ (3) $76 \div 38$ (4) $94 \div 47$

(5) $25 \div 12$ (6) $78 \div 11$ (7) $84 \div 41$ (8) $94 \div 45$

Use of your finger

It's convenient to use your finger when you check the place.

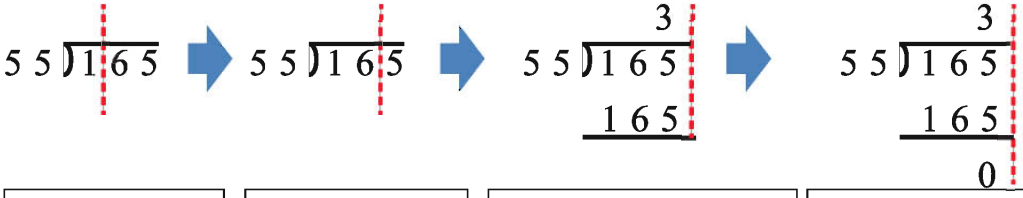


5 There are 165 pencils in a box. If we distribute an equal number of pencils to 55 people, how many pencils will each person get?

For dividing into equal numbers, we choose [ ].

Mathmatical sentence is: [ ]

Estimation: 165 ÷ 55 → 160 ÷ 50 → 16 ÷ 5 → About **3**



1. In **hundreds place**, we cannot do 1 ÷ 55. So move to **tens place**.

2. In **tens place**, we also cannot do 16 ÷ 55. So move to **ones place**.

3. Now we can do 165 ÷ 55. We write estimated **3** as a quotient on ones place. Multiply 55 by 3 and get 165.

4. Subtract 165 from 165 and get **0**. No remainder.

165 ÷ 55 = 3

Answer: Each person will get 3 pencils.

5 Do vertical calculation.

(1) 129 ÷ 43 (2) 128 ÷ 32 (3) 415 ÷ 83 (4) 359 ÷ 51

(5) 382 ÷ 62 (6) 314 ÷ 43 (7) 662 ÷ 94 (8) 239 ÷ 47

Estimation is not always correct. It may be higher or lower. Then we have to revise it.

Do division.

(1) 95 ÷ 34 → 90 ÷ 30 → 9 ÷ 3 → 3

Choose smaller number

$$\begin{array}{r} 3 \\ 34\overline{)95} \\ 102 \\ \text{Too large to subtract!} \end{array} \Rightarrow \begin{array}{r} 2 \\ 34\overline{)95} \\ 68 \\ \hline 27 \end{array}$$

If your estimated quotient is too large, put the next smaller number.

(2) 189 ÷ 27 → 189 ÷ 27 → 180 ÷ 20 → 9

$$\begin{array}{r} 9 \\ 27\overline{)189} \\ 243 \\ \text{Too large to subtract!} \end{array} \Rightarrow \begin{array}{r} 8 \\ 27\overline{)189} \\ 216 \\ \text{Still too large!} \end{array} \Rightarrow \begin{array}{r} 7 \\ 27\overline{)189} \\ 189 \\ \hline 0 \end{array}$$

(3) 77 ÷ 18 → 77 ÷ 18 → 70 ÷ 20 → About 3

$$\begin{array}{r} 3 \\ 18\overline{)77} \\ 54 \\ \hline 23 \end{array} \Rightarrow \begin{array}{r} 4 \\ 18\overline{)77} \\ 72 \\ \hline 5 \end{array}$$

23 includes one more 18.

If the remainder is too large, put the next larger number.

Do division.

(1) 86 ÷ 24 (2) 97 ÷ 19 (3) 91 ÷ 13 (4) 75 ÷ 15

2018

There are 432 pieces of paper. If you distribute an equal number of pieces to 18 people, how many will each people get?

When we divide equally we use _____.

Mathmatical sentence is: _____

Estimation: 430 ÷ 20 → 43 ÷ 2 → About **20**

$$18\overline{)432}$$

$$\begin{array}{r} 2 \\ 18\overline{)432} \\ 36 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 2 \\ 18\overline{)432} \\ 36 \\ \hline 72 \end{array}$$

$$\begin{array}{r} 24 \\ 18\overline{)432} \\ 36 \\ \hline 72 \\ 72 \\ \hline 0 \end{array}$$

1. In hundreds place we cannot do 4 ÷ 18, but in tens place, we can do 43 ÷ 18.

2. Write **2** as quotient of tens place on top and multiply 18 by 2 to get **36**. Subtract 36 from 43 and get **7**.

3. Move to ones place and bring **2** down. Now we have **72**.

4. Now we do **72** ÷ 18 and find **4** as quotient of ones place and no remainder.

We should compare the quotient with the estimation to check whether it's correct or not. In this case 24 is near to 20. It's OK.

432 ÷ 18 = 24

Each person will get 24 sheets.

7 Do vertical division.

(1) 682 ÷ 22 (2) 945 ÷ 45 (3) 672 ÷ 32 (4) 739 ÷ 32

(5) 572 ÷ 12 (6) 610 ÷ 19 (7) 690 ÷ 16 (8) 970 ÷ 46

Do following vertical division.

$941 \div 23$

$$\begin{array}{r} 4 \\ 23\overline{)941} \\ 92 \\ \hline 21 \end{array} \qquad \begin{array}{r} 40 \\ 23\overline{)941} \\ 92 \\ \hline 21 \\ 0 \\ \hline \mathbf{21} \end{array}$$

21 ÷ 23 is not possible but there should be a quotient in ones place. So put "0" as quotient of ones place.

Do vertical division.

(1) $711 \div 23$ (2) $731 \div 18$ (3) $763 \div 25$ (4) $810 \div 27$

4.3 Division of four-digit number by two-digit.

Do vertical calculation.

(1) $3266 \div 23$ → 3000 ÷ 20 → 300 ÷ 2 → About 150

$$\begin{array}{r} 1 \\ 23\overline{)3266} \\ \mathbf{23} \\ \hline \mathbf{9} \end{array} \qquad \begin{array}{r} 14 \\ 23\overline{)3266} \\ 23 \\ \hline \mathbf{96} \\ \mathbf{92} \\ \hline \mathbf{4} \end{array} \qquad \begin{array}{r} 142 \\ 23\overline{)3266} \\ 23 \\ \hline \mathbf{96} \\ \mathbf{92} \\ \hline \mathbf{46} \\ \mathbf{46} \\ \hline \mathbf{0} \end{array}$$

3266 ÷ 23 = 142

(2) 1576 ÷ 17 → 1600 ÷ 2 → 160 ÷ 2 → about 80

$$17\overline{)1576} \rightarrow \begin{array}{r} 9 \\ 17\overline{)1576} \\ 153 \\ \hline 4 \end{array} \rightarrow \begin{array}{r} 92 \\ 17\overline{)1576} \\ 153 \\ \hline 46 \\ 34 \\ \hline 12 \end{array}$$

1576 ÷ 17 = 92 remainder 12

(1) and (2) are both divisions of "4-digit ÷ 2-digit". And one quotient are 3-digit number and another is 2-digits. That's mysterious.

Can you tell why the difference occurs?

1 Do vertical division.

(1) 3038 ÷ 14 (2) 7824 ÷ 48 (3) 5876 ÷ 32 (4) 4213 ÷ 27

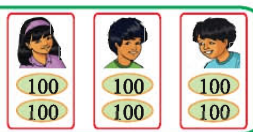
(5) 4032 ÷ 63 (6) 4920 ÷ 54 (7) 6100 ÷ 72 (8) 1512 ÷ 126

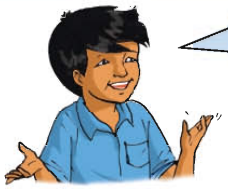
Challenge!

4.4 The simple method

Let's find the simple way to get to answers.

1 Compare the division of 6÷2, 60÷20 and 600÷200

6 ÷ 2	6 candies are distributed so that each person gets 2 pieces…	
60 ÷ 20	60 candies are distributed so that each person gets 20 pieces…	
600 ÷ 200	600 candies are distributed so that each person gets 200 pieces…	



Wow! In all the cases, three people get candies.

$$6 \div 2 = 3$$
$$\downarrow \times 10 \quad \downarrow \times 10$$
$$60 \div 20 = 3$$
$$\downarrow \times 100 \quad \downarrow \times 100$$
$$600 \div 200 = 3$$

Equal

$$6 \div 2 = 3$$
$$\uparrow \div 10 \quad \uparrow \div 10$$
$$60 \div 20 = 3$$
$$\uparrow \div 100 \quad \uparrow \div 100$$
$$600 \div 200 = 3$$

Equal

If you multiply or divide the divisor and dividend in a division problem by the same number, the quotient stays the same.

We can apply this properties of division to our calculation.

2 Using the properties of division, let's try following calculation.

(1) 800 ÷ 200 (2) 1400 ÷ 200 (3) 3500 ÷ 700

(4) 5400 ÷ 60 (5) 1000 ÷ 100 (6) 10000 ÷ 1000

It is one idea to score out the same number of 0s.
[Example] 8~~00~~ ÷ 2~~00~~ = 8 ÷ 2, 540~~0~~ ÷ 6~~0~~ = 540 ÷ 6

3 3500÷250 was calculated by Ripa, Sumon and Sohag with the simple method. Let's explain their ideas.

(1) Ripa 

$$3500 \div 250$$
$$\downarrow \div 10 \quad \downarrow \div 10$$
$$350 \div 25 = 14$$

(2) Sumon 

$$3500 \div 250$$
$$\downarrow \quad \downarrow$$
$$350 \div 25$$
$$\downarrow \quad \downarrow$$
$$70 \div 5 = 14$$

(3) Sohag 

$$3500 \div 250$$
$$\downarrow \quad \downarrow$$
$$350 \div 25$$
$$\downarrow \quad \downarrow$$
$$1400 \div 100 = 14$$

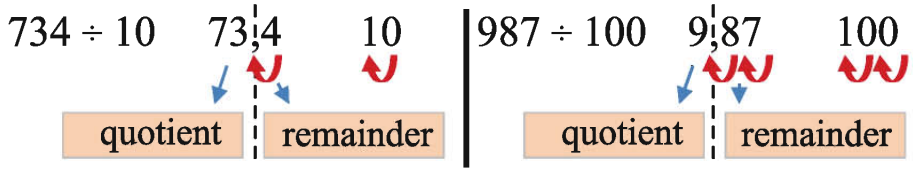
Using the properties of division, try following calculation and compare your idea with your friends.

(1) $250 \div 50$ (2) $8100 \div 900$

(3) $150 \div 25$ (4) $700 \div 25$

Let's do the calculation to check whether the following method is right or not.

If we divide a number by 10 or 100 by easy process, we put comma after as many digits from the right of the dividend as the number of zeroes on the right side of the divisor. Then the number of the left of the comma of the dividend will be quotient and number on its right side will be remainder.



Now let's do the following exercise with above method.

(1) $876 \div 10$ (2) $1234 \div 10$ (3) $765 \div 100$ (4) $9765 \div 100$

4.5 Exercise

1. Do division.

(1) $60 \div 30$	(2) $90 \div 40$	(3) $240 \div 30$	(4) $310 \div 40$
(5) $45 \div 15$	(6) $92 \div 46$	(7) $83 \div 41$	(8) $99 \div 28$
(9) $168 \div 42$	(10) $455 \div 73$	(11) $224 \div 28$	(12) $141 \div 27$
(13) $837 \div 27$	(14) $691 \div 16$	(15) $928 \div 43$	(16) $764 \div 25$
(17) $2795 \div 13$	(18) $3030 \div 14$	(19) $1674 \div 18$	(20) $9316 \div 32$

2. Do division with the simple method.

(1) $7600 \div 200$ (2) $7200 \div 900$

(3) $100000 \div 1000$ (4) $350 \div 25$

3. Write one number to apply to each blank box.

Challenge!

(1)

$$\begin{array}{r} 2 \\ 3\square\overline{)69} \\ \square 8 \\ \hline 1 \end{array}$$

(2)

$$\begin{array}{r} 2\square \\ 1\square\overline{)29\square} \\ 28 \\ \hline 1\square \\ 14 \\ \hline 3 \end{array}$$

(3)

$$\begin{array}{r} \square\square \\ \square 3\overline{)4\ \square 0} \\ 46 \\ \hline \square 0 \\ 0 \\ \hline 10 \end{array}$$

4. The quotient becomes 3 and remainder is 10 when we divide a certain number by 34. What is the number?

5. There are 99 children. You are making group of 11 to play football games. How many groups can you make?

6. You want to divide 182 postcards equally among 26 people. How many postcards should you give each person?

7. There are 500 pencils. We're putting 12 of them in each box. How many boxes do we need and how many pencils remain?

8. A wire of length 1716 meters is divided into 78 equal parts. What is the length of each part?

9. Price of the rice of 85 Kg is taka 2295. What is the price of 1 kg rice?

10. You have 2784 *puties*. And you're going to make some garland (*mala*) with 98 of them. How many garlands can you make with them?

Chapter Five

Problems related to Four Basic Operations

5.1 Mathematical Sentence and Calculation Order

Let's be used to mathematical sentences and learn calculation order!

1 Sohel bought a chicken of taka 230, later he also bought pulse of taka 60 and spices of taka 40. Write a mathematical sentence to calculate the total cost and solve it.

Let's try to express the situation to single mathematical sentence.

Mathematical sentence:

Let's see these ideas, compare the mathematical sentences and explain how Hasan and Shila thought to solve the problem.

Hasan

$230 + 60 + 40$
$= 330$
Taka 330

Shala

$230 + (60 + 40)$
$= 130 + 100$
$= 330$ Taka 330

How interesting! mathematicals sentences tell us how the one thought about solving the problem.

The answer is the same whether you add the terms one by one or group them first. You can use bracket "( )" to show you are calculating by grouping. **In general, we calculate from left to right**, but **calculate the numbers inside the bracket first** when we have the bracket.

$230 + 60 + 40$ (① then ②)

$230 + (60 + 40)$ (① then ②)

2 Rita had taka 820. She gave her daughter taka 260 and her son taka 240. Write a mathematical sentence to calculate how much she has now and solve it.

Mathematical sentence: ____

Let's compare the ideas of Mitu and Sabuj and explain how they thought.

Mitu's idea

820 − 260 − 240

= 560 − 240

= 320 Taka 320

Sabuj's idea

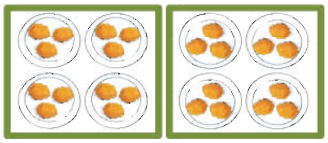
820 − (260 + 240)

= 820 − 500

= 320 Taka 320

The answer is the same whether you subtract the terms one by one or group them inside the bracket to add first and subtract. In case of subtraction, you need to be careful about calculation inside the bracket, because it's addition.

3 There are 2 trays and each has 4 plates on it. I have put 3 piajus in each plate. Write a mathematical sentence to calculate how many piajus are there in 2 trays and solve it.



Mathematical sentence: ____

Kazol's idea

3 × 4 × 2

= 12 × 2

= 24 24 piajus

Aminul's idea

3 × (4 × 2)

= 3 × 8

= 24 24 piajus

Kazol finds the number of piaju on one tray (3×4) first, right?

Aminul thinks about the number of plates (4×2), firstly.

Sometimes, these rules enable us to calculate easier. Let's try to do next exercise.

1 Calculate and compare the answer.

(1) $\begin{cases} 128 + 92 + 8 \\ 128 + (92 + 8) \end{cases}$ (2) $\begin{cases} 376 + 181 + 19 \\ 376 + (181 + 19) \end{cases}$

(3) $\begin{cases} 657 - 64 - 36 \\ 657 - (64 + 36) \end{cases}$ (4) $\begin{cases} 928 - 375 - 125 \\ 928 - (375 + 125) \end{cases}$

(5) $\begin{cases} 37 \times 20 \times 50 \\ 37 \times (20 \times 50) \end{cases}$ (6) $\begin{cases} 78 \times 25 \times 4 \\ 78 \times (25 \times 4) \end{cases}$

2 Express the following problems to a single mathematical sentence and solve it.

(a) Price of a pencil box is taka 150. How many pencil boxes can you purchase by taka750?

Mathematical sentence: ☐

The answer: _____

(b) A box contains a bat of taka 100 and a ball of taka 50. How many boxes can you purchase by taka 750?

Mathematical sentence: ☐

The answer: _____

3 Make your own story for Mathematical sentences below and solve them.

(1) $200 + (150 + 70)$

(2) $100 - (10 + 60)$

My story is this:
In our garden, we had 200 Rose plants. Now my mother plants 150 and my father plants more 70. How many Rose plants do we have now?

Let's try to make general Mathematical sentence using "( )"for each of the following problem.

(a) Price of a *Singara* is taka 6 and I have a 100 taka note. How much is the change if I buy ten *Singaras*?

$\square - (\square \times \square)$

(b) Price of a Hilsha fish i taka 300 and a pair of pigeon is taka 200. How much is the cost if I buy one Hilsha fish and one pigeon?

$\square + (\square \div \square)$

(c) Price of a cabbage is taka 25 and a pumpkin is taka 60. How much is the cost of 2 cabbages and 3 pumpkins?

$(\square \times \square) + (\square \times \square)$

When you solve both addition or subtraction and multiplication or division in the same Mathematical sentence, the rule is that you must calculate the multiplication or division first. (But in multiplication and division, you must calculate from left to right.)
With this rule, we don't have to use "( )" in the Mathematical sentences above. We can rewrite them like this:

(a) $100 - (10 \times 6) \Rightarrow 100 - 10 \times 6$

(b) $300 + (200 \div 2) \Rightarrow 300 + 200 \div 2$

(c) $(25 \times 2) + (60 \times 3) \Rightarrow 25 \times 2 + 60 \times 3$

4 Calculate them.

Be careful about the order of the calculation.

(1) $6 + 12 \times 5$ (2) $300 - 150 \div 50$

(3) $200 - 25 \times 4$ (4) $60 + 30 \div 6$

Calculate applying the rules for calculation order.

(a) $9 \times 8 + 4 \times 2$

(b) $9 - 8 \div 4 \times 2$

(c) $9 - (8 - 4 \times 2)$

(a) $9 \times 8 + 4 \times 2 = 72 + 4 \times 2$
① ③ ②
$= 72 + 8$
$= 80$

(b) $9 - 8 \div 4 \times 2 = 9 - 2 \times 2$
① ③ ②
$= 9 - 4$
$= 5$

(c) $9 - (8 - 4 \times 2) = 9 - (8 - 8)$
③ ② ①
$= 9 - 0$
$= 9$

- In general, calculate from left to right.
- If there are both + or − and × or ÷, calculate the × or ÷ first.
- If there are "( )", calculate inside the "( )" first.

Calculate them.

(1) $16 - 4 + 2$

(2) $16 - (4 + 2)$

(3) $16 \div 4 \div 2$

(4) $16 \div (4 \div 2)$

(5) $16 + 4 \div 2$

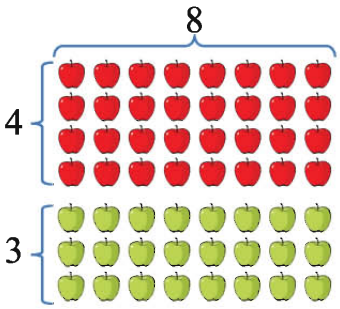
(6) $(16 + 4) \div 2$

5.2 Rules and Ideas for Calculation

Let's get the new rules and ideas for calculation.

1 There are some red apples and green apples. How many are there in total?

We can solve it in many ways.



Dipika's idea

$(4 + 3) \times 8 = 56$

56 apples

Shaymol's idea

$4 \times 8 + 3 \times 8 = 56$

56 apples

We get the same answers with both Mathematical sentences. Even though Mathematical sentences are different, you can connect with equal sign as long as the answers are equal on both sides.

$$(4 + 3) \times 8 = 4 \times 8 + 3 \times 8$$

Here are some rules for Mathematical sentences which use ( ).

$$(\blacksquare + \blacktriangle) \times \bullet = \blacksquare \times \bullet + \blacktriangle \times \bullet$$
$$(\blacksquare - \blacktriangle) \times \bullet = \blacksquare \times \bullet - \blacktriangle \times \bullet$$

It can be verified by putting different numbers in place of ■, ▲ and ●.

1 Calculate to make sure that both Mathematical sentences are equals following above rules:

(a) $(135 - 35) \times 7$ (a') $135 \times 7 - 35 \times 7$

Use calculation rules to get the answer.

(1) 25×32

Remember the fact: $25 \times 4 = 100$
If you can find 4, it'll be very easy.

$25 \times 32 = 25 \times (4 \times 8)$

$= (\square \times \square) \times 8$

$= (\square) \times 8$

$= \square$

(2) 99×9

I know that "$99 = 100 - 1$"
Let's use this!
If you can find 4, it'll be very easy.

$99 \times 9 = (100 - 1) \times 9$

$= \square \times 9 - \square \times 9$

$= \square - \square$

$= \square$

2 Find an alternative easier way to calculate the following. Explain your idea in your notebook.

(1) 25×16 (2) 24×25 (3) 50×18

(4) 98×5 (5) 102×11 (6) 999×9

3 Solve it by using calculation rules.

(1) Bidhan Tripura bought five water melons of taka 98 each. How much did it cost?

(2) Maya has 36 small bags. Each bag has 25 olive inside. How many olive does she have in total?

5.3 Exercise

1. Calculate applying the rules for calculation order.

(1) $7 \times 8 - 6 \div 2$ (2) $7 \times (8 - 6 \div 2)$

(3) $(7 \times 8 - 6) \div 2$ (4) $7 \times (8 - 6) \div 2$

2.Using the calculation rules to calculate the following

(1) $724 + 87 + 13$ (2) $624 - 76 - 24$

(3) $20 \times (66 \times 50)$ (4) $4 \times 92 \times 25$

(5) 32×25 (6) 97×8

3. Express the situation to single Mathematical sentence and solve it.

(1) Price of 5 pencils is taka 60. How much are the 9 pencils?

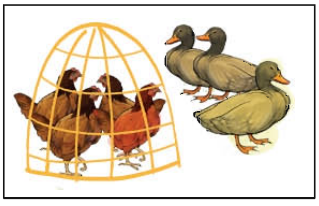
(2) Divisor is 3 times the remainder and the quotient is 4 times the divisor. Remainder is 2. What is the dividend?

(3) Monthly salary of Ms Shampa is taka 7500. She spends taka 7250 for every month. How much money does she save in a year?

4. Rupa and Moni have taka 875 together. Moni has taka 125 more than that of Rupa. How much money do they have separately?

5. Sum of the ages of father and son is 55 years. Father's age is 4 times the son's. How old are they individually?

6. Price of 4 hens and 3 ducks together is taka 639. Price of 1 duck is taka 85. What is the price of 1 hen?



7. Make your own story for Mathematical sentences below and solve them.

(1) $200 - (10 \times 8)$

(2) $(6 \times 8) + (12 \times 2)$

Chapter Six

Mathematical Symbols

6.1 Mathematical Symbols

Let's learn about mathematical symbols.

Look at following mathematical sentences. These are consisted of various mathematical symbols. Try to classify them.

$2 + 3$	$30 \div 5 + 8$	$7 - 6 = 1$
$4 \times 6 < 26$		$35 \div 5 \not< 2 \times 3$
$8 \times 7 \neq 55$	$35 \not> 53$	$9 \times 6 > 45$

Mathematical symbols are classified as shown below:

Symbols used for writing down the numbers are called:
Numeral Symbols 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9

Symbols used for basic four operations are called:
Operation Symbols +, −, × and ÷

Symbols used to indicate the mutual relation are called:
Relation Symbols =, >, <, ≠, ≯ and ≮

We have to be careful about the names of the **Relation Symbols.**

= equal	> greater than	< smaller than
≠ **not equal**	≯ **not greater than**	≮ **not smaller than**

1 Express the following by using the mathematical symbols.

(1) Forty-seven is not greater than ninety- six.

(2) Nine hundred and nine is not equal to nine thousand and nine.

(3) Twenty-five is not less than twenty-four.

2 Put "=" or "≠" in the blank boxes.

(1) $3 \times 5 \square 15$ (2) $24 \div 12 \square 3$

3 Put "$\lessdot$" or "$\gtrdot$" in the blank boxes.

(1) 73 $\square$ 37 (2) $20 + 9 \square 30$

2 Put the appropriate **relation symbols** in the blank box.

(1) $6 + 2 \times 4 \square (6 + 2) \times 4$

(2) $52 - 15 + 13 \square 52 - (15 - 13)$

Let's calculate the left and right side of the relation symbols separately and compare them.

(1) [left side] [true side]

$6 + 2 \times 4 = 6 + 8 = \mathbf{14}$

$(6 + 2) \times 4 = 8 \times 4 = \mathbf{32}$

$\underline{14 < 32}$

$\therefore 6 + 2 \times 4 \square (6 + 2) \times 4$

"$\therefore$" is a symbol which means "therefore."

(2) [left side] [true side]

$52 - 15 + 13 = 37 + 13 = \mathbf{50}$

$52 - (15 - 13) = 52 - 2 = \mathbf{50}$

$\underline{50 = 50}$

$\therefore 52 - 15 + 13 \square 52 - (15 - 13)$

Can we put any other symbols which is related to these examples?

4 Put the appropriate relation symbols in the blank box.

(1) $142 - 65 \square 57 + 12$

(2) $63 \div 7 \times 5 \square 63 \times 5 \div 7$

6.2 "true" or "false" with Mathematical sentences

Let's study "true" and "false" with mathematical sentences.

Ex 1 The following are all mathematical sentences. Which is true and which is false?

(a) $15 + 7 = 22$
(b) $12 \div 5 = 5$
(c) $6 \times 3 = 2 \times 9$
(d) $3 \times 12 < 30 + 2$

Compare the left side and right side of the relation symbols carefully.

[left side] [right side]

(a) $15 + 7 = \mathbf{22}$ = **22** ∴ **true sentence**

Because22 is equal to 22.

(b) $12 \div 5 = \mathbf{2\ R2}$ = **5** ∴ **false sentence**

Because 2 remainder 2 is **not** equal to 5

(c) $6 \times 3 = \mathbf{18}$ = $2 \times 9 = \mathbf{18}$ ∴ **true sentence**

Because 18 is equal to 18.

(d) $3 \times 12 = \mathbf{36}$ < $30 + 2 = \mathbf{32}$ ∴ **false sentence**

Because 36 is **greater** than 32.

Mathematical sentence may be true or false.

1 Look at following mathematical sentences. Which is true and which is false?

(a) $46 - 7 = 40$

(b) $18 \div 9 \not> 2$

(c) $12 \times 5 \neq 120 \div 2$

2 Is following mathematical sentence "true"?

$\square + 9 = 15$

[left side] $\square + 9$ = [right side] 15

???

true sentence?
false sentence?

With the mathematical sentence above, we can not say it's true or false immediately. It may be true or false. So it's open. Such a mathematical sentence is called open sentence.

In this case, if 6 is put in $\square$, the mathematical sentence will be true. And if another number is put, the mathematical sentence will be false.

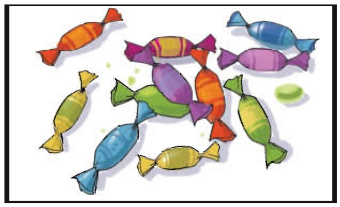
$\boxed{6} + 9 = 15$ **true sentence**

$\boxed{5} + 9 = 15$ **false sentence**

This $\square$ can take any value. The mathematical sentence true or false depends on the value which is put in the $\square$.

6.3 Mathematical sentences with

Let's make and solve mathematical sentences with □.



Mukta has some candies and Apu has 6 candies. The total number of the candies they have is 18.

(1) Write a mathematical sentence for above statement, assuming that Mukta has □ number of candies.

(2) Find the unknown number to be filled in for □.

---

(1) The mathematical sentence should be: □ + 6 = 18

(2) The number to be filled in for □ should be:

We can fill in the box by different numbers and find it.

□ + 6 = 18 ×

11 + 6 = 18 ×

12 + 6 = 18 ✓

13 + 6 = 18 ×

We can solve it using the relation between addition and subtraction.

□ = 18 − 6

= 12

□ = 12

1 There were 21 Borois. Some of the Borois were eaten by some friends and 14 of them remained.

(1) Write a mathematical sentence assuming the number of Borois eaten is □ pieces.

(2) Find the unknown number.

32 pieces of Ruti are divided equally among some people and each person gets 8 pieces.

(1) Write a mathematical sentence assuming the number of people is $\square$.

(2) Find the unknown number.

---

(1) The mathematical sentence should be: $32 \div \square = 8$

(2) Unknown number to be filled in for $\square$ should be:

We can also fill in the box by different numbers and find it.

$32 \div \boxed{2} = 8$ ✗

$32 \div \boxed{3} = 8$ ✗

$32 \div \boxed{4} = 8$ ✓

$32 \div \boxed{5} = 8$ ✗

We can solve it using the way of checking answers of division:

$8 \times \square = 32$

And to solve this, we can do:

$\square = 32 \div 8$

$= 4$

$\square = 4$

2 Write mathematical sentences of the following statements using $\square$ as the unknown numbers and find the value of $\square$.

(1) 12 is added with a number such that their sum becomes 180.

(2) A number is multiplied by 15 such that their product becomes 270.

6.4 Exercise

1. Put a relation symbol in the blank boxes so that the obtained statement is true.

   (1) $87 + 13 \square 108 - 19$

   (2) $267 - 25 - 27 \square 267 - (25 + 27)$

   (3) $343 \div 7 \div 7 \square 343 \div (7 \times 7)$

2. Verify which of the following statements are true and which are false.

   (1) $76 - 34 + 30 = 76 - (34 - 30)$

   (2) $200 - 25 \times 4 \neq (200 - 25) \times 4$

   (3) $32 \div 4 \div 2 \not< 32 \div (4 \div 2)$

   (4) $3 \times 6 + 4 \times 2 = 3 \times (6 + 4) \times 2$

3. Put such an operational sign in the blank boxes so that the obtained statement is true.

   (1) $69 \square 13 = 7 \square 8$

   (2) $58 \square 29 = 96 \square 9$

   (3) $8 \square 5 = 1200 \square 30$

   (4) $87 \square 38 = 7 \square 7$

4. Put such a number in each of the following open sentences so that the obtained statement is true.

   (1) $\square + 9 = 49 - 15$

   (2) $9 \times \square = 36 \times 2$

   (3) $81 \div \square = 27 \div 3$

   (4) $3 + 8 \times \square = 35$

5. Express the following questions by using $\square$ and find the unknown number.

   (1) A number is divided by 7. Quotient is 5 and remainder is 4.

   (2) 7 is multiplied by the sum of a number and 3. And product is 56.

Chapter Seven

Multiples and Factors

7.1 Multiples and Common Multiple

Let's learn about multiples.

In the shop, boxes which contains cookies and chocolates are piled up separately.

The height of the boxes which contains cookies is 3 cm.
Let's find the relation between the numbers of the boxes and the total height of them when we pile up the boxes.

number of the boxes	1	2	3	4	5	6	7
Total height (cm)	**3**	**6**	**9**	**12**			

The numbers like 3, 6, 9, and 12 are formed by multiplying a number by 3. They are called **multiples of 3.** Multiples of 3 are divisible by 3.

The multiples of 3 are: 3×1=3, 3×2=6, 3×3=9, and many, many more.

multiples of 3

3 6 9 12
15 18 21
24 27 30
33 36...

When we talk about multiples, we usually do not include multiples of 0 or numbers multiplied by 0.

1 Circle **multiples of 2** on the number line below. And also circle **multiples of 3,multiples of 4** and **multiples of 5** on the number line. (Some have been done for you.)

multiples of 2: 0 1 (2) 3 (4) 5 (6) 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

multiples of 3: 0 1 2 (3) 4 5 (6) 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

multiples of 4: 0 1 2 3 (4) 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

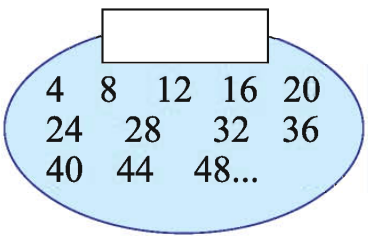
multiples of 5: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

2 Which numbers in the box below are the multiples of 7?

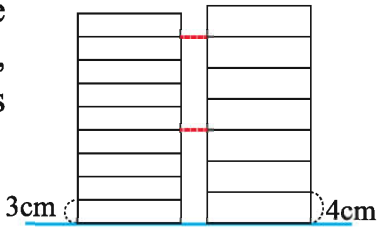
7	16	21	32	65	84

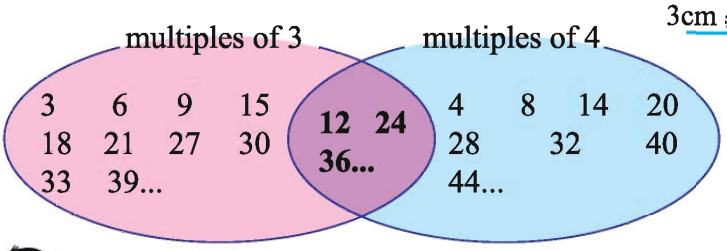
Remember that multiples of 7are divisible by 7.

3 The height of the boxes which contains chocolates is 4 cm. When we pile up the boxes, how should we call the numbers for expressing the total height?



2 If we keep piling up the cookis boxes with the height of 3 cm and chocolate boxes with the height of 4 cm separately, when does the height of both piled boxes become equal?





Wow, we can find the answer using multiples of both 3 and 4.

Answer: the height is equal when the height becomes 12, 24, 36…

Numbers that are multiples of both 3 and 4 are called **common multiples** of 3 and 4.
The **common multiples** of 3 and 4 are 12, 24, 36, and many more.

3 Find the common multiples of 6 and 8.

Let's compare these two ideas.

Multiples of 6: 6, 12, 18, 24, 30, 36, 42, 48...

Multiples of 8: 8, 16, 24, 32, 40, 48, 56, 64, 72...

Mousumi

Firstly, I listed the multiples of 6 and multiples of 8, and then looked for the numbers that were the same.

Multiples of 8: 8, 16, 24, 32, 40, 48, 56, 64, 72...
Multiples of 6: × × ✓ × × ✓ × × ✓

Tamim

I looked for the multiples of 6 in a list of multiples of 8.

Answer: The common multiple of 6 and 8 are 24, 48, 72 and more.

The smallest common multiple is called the **least common multiple (LCM)**. The least common multiple of 6 and 8 is 24.

4 List 3 common multiples for the following pairs of numbers, ordering them from the smallest. And also write the least common multiples (LCM).

(1) 2, 3 (2) 4, 5 (3) 10, 5 (4) 3, 7

By the way, can we also find common multiples for sets of 3 numbers?

Yes, with similar way. Let's try it on the next page.

2018

Find common multiples and the least common multiple (LCM) for 2, 3, and 4.

Multiples of 2: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24...
Multiples of 3: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36...
Multiples of 4: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40...

Multiples of 4: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40...
Multiples of 3: × × ✓ × × ✓ × × ✓ ×
Multiples of 2: × × ✓ × × ✓ × × ✓ ×

Can everyone explain how to do it?

Which way do you think is easier?

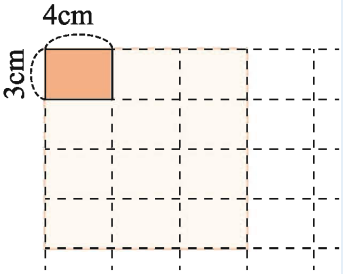
Answer: Common multiples for 2, 3, and 4 is **12, 24, 36** and more.

Least common multiple (LCM) of 2,3,and 4 is **12**

5 Find the least common multiple (LCM) of following.

(1) 4, 6, and 9 (2) 4, 8, and 12 (3) 4, 5, and 6

5 We want to arrange rectangular tiles 3 cm wide and 4 cm long like the figure on the right to make the smallest square possible. How many cm are the sides of the smallest square we can make?



The widths are 3, 6, 9, 12… and the lengthare 4, 8, 12, 16…

It's going to be the least common multiple (LCM) of 3 and 4.

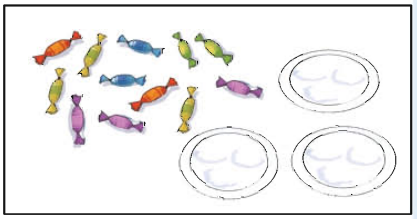
Multiples of 4: 4, 8, 12, 16, 20, ...
Multiples of 3: × × ✓

Answer:The sides of the smallest square is 12 cm.

7.2 Factors and Common Factors

Let's learn about factors.

1 We want to divide 12 candies evenly among several plates. How many plates can you have without having any candies remaining?



Let's find the answer by starting puting the candies on 1 plate and then keep going with 2 plates to12 plates one by one.

Number of plates	1	2	3	4	5	6	7	8	9	10	11	12
Without Remaining: ✓	✓	✓										
With remaining: ✗					✗							

If we have 1 plate, we can put 12 candies on it.

If we have 2 plates, we can put 6 candies each.

If we have 5 plates, we can put 2 candies each but 2 remain...

Answer: 1, 2, 3, 4, 6, 12 plates to put the candies on without having any remaining.

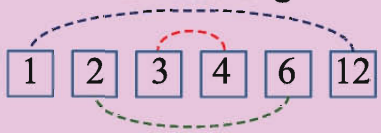
The numbers that can divide 12 evenly are called the **factors of 12**.
The number 12 has 6 factors:
1, 2, 3, 4, 6, and 12.
1 and the number itself are included in its factors.

I find relation between factors and multiples.
For example:
3 and 4 are the **factors** of 12,
and 12 is the **multiple** of 3 and 4.

$$12 = \underset{\text{factor}}{4} \times \underset{\text{factor}}{3}$$

multiple

I also find relation among each factor.



Each factor has pairs of which product is 12.

Find and check the factors. Then exchange what you notice with your friends.

Factors of 4	✓ ✓ ✓ 1 2 3 4
Factors of 5	1 2 3 4 5
Factors of 6	1 2 3 4 5 6
Factors of 7	1 2 3 4 5 6 7 8
Factors of 13	1 2 3 4 5 6 7 8 9 10 11 12 13
Factors of 16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Factors of 18	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Basically, you need to start by 1 and then going on with 2 and so on. But finding the pair of factors help us find all the factors without omission.

Factors of 18	✓ ✓ ✓ ✓ ✓ ✓ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Find all the factors.

(1) 7 (2) 9 (3) 10 (4) 24 (5) 36

3 We have to divide 12 candies and 18 pieces of chocolate into equal numbers and putting them on same plates. How many plates can we have to put candies or pieces of chocolate without having any remaining?

If we have 1 plate, we can put 12 candies and 18 pieces of chocolate on it.
If we have 2 plates, we can put 6 candies and 9 pieces of chocolate each…

Oh, it's a question of factors! Let's find factors of 12 and 18.

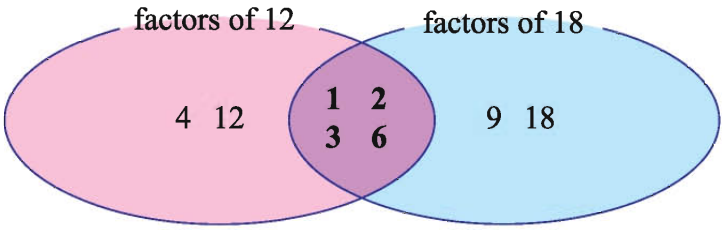
Factors of 12	✓1 ✓2 ✓3 ✓4 5 ✓6 7 8 9 10 11 ✓12
Factors of 18	✓1 ✓2 ✓3 4 5 ✓6 7 8 ✓9 10 11 12 13 14 15 16 17 ✓18

If we have 3 plates, we can put 4 candies and 6 pieces of chocolate each.

If we have 4 plates, we can put 3 candies and 4 chocolates in each plate. But chocolates there will be remaining.

Answer: 1, 2, 3, and 6 plates without having any candies or pieces of chocolate remaining.

The numbers that are factors of both 12 and 18 are called the **common factors of 12 and 18**.
Thecommon factors of 12 and 18 are:1, 2, 3, and 6.



4 Find the common factors of 24 and 36.

Let's compare these two ideas and explain how to do it.

Mukta

Factors of 24: 1, 2, 3, 4, 6, 8, 12, 24
Factors of 36: 1, 2, 3, 4, 6, 9, 12, 18, 36

Devid

Factors of 24: 1, 2, 3, 4, 6, 8, 12, 24
Factors of 36: ✓ ✓ ✓ ✓ ✓ × ✓ ×

Answer: The common factors of 24 and 36 are 1, 2, 3, 4, 6 and 12.

The largest common factor of two numbers is called the **highest common factor (HCF)**.
The highest common factors of 24 and 36 is 12.

5 Find the common factors and the highest common factor(HCF).

(1) 4, 15

Factors of 4: 1, 2, 4
Factors of 15: 1, 3, 5, 15

Factors of 4: 1, 2, 4
Factors of 15: ✓ × ×

Both of the numbers only have 1 as a common factor!

(2) 9, 27

Factors of 9: 1, 3, 9
Factors of 27: 1, 3, 9, 27

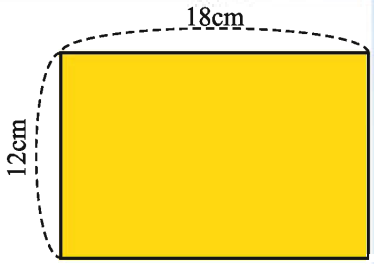
Factors of 9: 1, 3, 9
Factors of 27: ✓ ✓ ✓

In this case, 9 itself is the highest common factor (HCF) of 9 and 27!

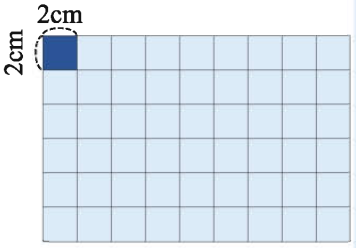
2 List all the common factors and tell the highest common factors (HCF).

(1) 12, 20 (2) 5, 8 (3) 28, 42
(4) 8, 16, 20 (5) 15, 18, 30 (6) 12, 36, 60

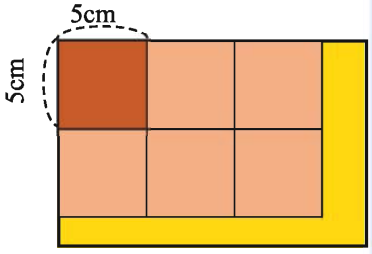
I have a piece of paper which is 18 cm long and 12 cm wide and I spread squares of the same size all over the surface of the paper.



(1) Is it possible to spread squares whose side is 2cm all over?



(2) Is it possible to spread squares whose side is 5cm all over?



(3) What relation is there between 12, 18 and the length of the side of the square?

12 is divisible by the length of the side of the square.

And 18 is also divisible by the same length.

(4) List all the possible lengths of the side of the square.

We list the common factors of 12 and 18, right?

Factors of 12: 1, 2, 3, 4, 6, 12
Factors of 18: 1, 2, 3, 6, 9, 18

Factors of 12: 1, 2, 3, 4, 6, 12
Factors of 18: ✓ ✓ ✓ × ✓ ×

(5) How long is the length of the side of the biggest possible square?

In this question, the highest common factor (HCF) matters.

7.3 Prime Numbers

Let's learn about Prime Numbers.

As the right table shows, 2, 3, 5, 7 have **only 1 and themselves as their factors**. These numbers are called **prime numbers**. 1 is not considered a prime number. Numbers that are neither 1 nor prime numbers are called **composite number**.

Factors of 18	✓ 1	✓ 2					
Factors of 18	✓ 1	2	✓ 3				
Factors of 18	✓ 1	2	3	4	✓ 5		
Factors of 18	✓ 1	2	3	4	5	6	✓ 7

Let's find prime numbers up to 100.

1. Cross out 1.
2. Circle 2. Cross out all multiples of 2 that are larger than 2 itself.
3. Circle 3. Of the remaining numbers, cross out all multiples of 3 that are larger than 3 itself.
4. Continue in this way until all the remaining numbers are crosses out.

Let's do a continuance by ourselves!

We don't have to cross out the multiples of 4 because they are also the multiples of 2.

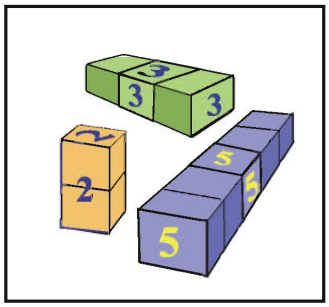
~~1~~	(2)	(3)	4	5	6	7	8	~~9~~	10
11	12	13	14	~~15~~	16	17	18	19	20
~~21~~	22	23	24	25	26	~~27~~	28	29	30
31	32	~~33~~	34	35	36	37	38	~~39~~	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Prime numbers up to 100 are as follows:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97

Why do we study Prime and Composite Numbers?

Because we are able to "break apart" composite numbers into prime number factors (**prime factors**). In other words, composite numbers can be made up by multiplication of prime numbers.
It is as if the prime numbers are the basic building blocks of all numbers.



[Example]

2, 3, 5, 7, and 11 are prime numbers.

$4=2\times2$ $12=2\times2\times3$ $20=2\times2\times5$ $42=2\times3\times7$

$81=3\times3\times3\times3$ $210=2\times3\times5\times7$ $385=5\times7\times11$

These composite numbers are made up by multiplication of prime numbers.

Put 2, 3 or 5 in the blank to make up the following composite numbers.

(1) $6 = \square \times \square$ (2) $8 = \square \times \square \times \square$

(3) $18 = \square \times \square \times \square$ (4) $30 = \square \times \square \times \square$

Let's try! divisibility of 2, 3, and 5 ---

Let's try to predict divisibility of the numbers.

1. Find the numbers which are divisible by **2**. Firstly, let's predict it. Then do division to check it.

   a) 224 b) 1146 c) 2283 b) 135798

We can distinguish by looking at the number of ones place.

If there is a 0, 2, 4, 6, or 8 in the ones place, the number is a **multiple of 2**. So they are divisible by 2.

2. Find the numbers which are divisible by **5**.

   a) 555 b) 354 c) 2230 d) 24685

This time, how do we find the rule?

If there is a 0 or 5 in the ones place, those numbers are a **multiple of 5**. So they are divisible by 5.

3. Choose the number which is divisible by **3**.

Hmm…Let's do division.

a) 261

$$\begin{array}{r} 87 \\ 3\overline{)261} \\ 24 \\ \hline 21 \\ 21 \\ \hline 0 \end{array}$$

2+6+1=9
9÷3=3
It's a multiple of 3.

b) 262

$$\begin{array}{r} 87 \\ 3\overline{)262} \\ 24 \\ \hline 22 \\ 21 \\ \hline 1 \end{array}$$

2+6+2=10
10÷3=3R1
It's not a multiple of 3.

c) 263

$$\begin{array}{r} 87 \\ 3\overline{)263} \\ 24 \\ \hline 23 \\ 21 \\ \hline 2 \end{array}$$

2+6+3=11
11÷3=3R2
It's not a multiple of 3.

There is a strange rule.

If the sum of the digits of each place is a **multiple of 3**, the number is a multiple of 3. So it is divisible by 3.

7.4 Exercise

1. List 3 multiples for the following numbers, ordering them from the smallest.

   (1) 4 (2) 7 (3) 11 (4) 14

2. List 3 common multiples for the following pairs of numbers, ordering them from the smallest. And also write the least common multiples (LCM).

   (1) 3, 4 (2) 4, 9 (3) 3, 9 (4) 5, 8

3. List all the factors of the following numbers.

   (1) 9 (2) 12 (3) 24 (4) 30

4. List all the common factors of the following numbers. And also write the highest common factors (HCF) for each pair.

   (1) 9, 15 (2) 14, 21 (3) 24, 40 (4) 5, 9

5. Find the least common multiples (LCM) and highest common factors (HCF) for each.

   (1) 8, 12, 24 (2) 9, 12, 18

6. Put 2, 3 or 5 in the blank to make up the composite number freely.

   (1) □ × □ × □ = □ (2) □ × □ × □ × □ = □

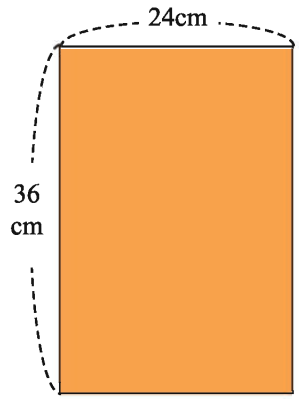
   (3) □ × □ × □ × □ = □

7. Find multiples of 2, 3 and 5 among numbers in the box.

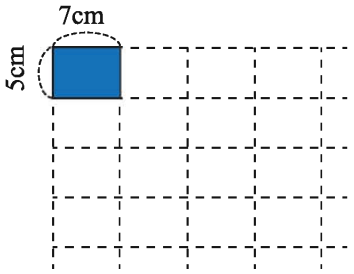
248, 339, 121, 515, 460, 912, 751, 555, 810, 951, 131, 725	(1) multiples of 2 [ ] (2) multiples of 3 [ ] (3) multiples of 5 [ ]

8. There are two bells. Bell A rings every 8 minutes and bell B rings every 6 minutes. The bells ring together at noon. When is the next time they will ring together?

9. I have a piece of paper with 36 cm long and 24 cm wide and I want to spread squares of the same size all over the surface of the paper. How long is the length of the side of the biggest square possible?



10. We arrange rectangular tiles 5 cm long and 7 cm wide like the figure on the right to make the smallest square possible. How many cm are the sides of the smallest square we can make?



11. There are 45 apples and 18 oranges to Rasel. Rasel want to distribute apples and oranges equally to maximum number of children without any remaining. Find the number of children. And how many apples and oranges do each children get?

Chapter Eight

Fractions

8.1 Common fractions with the same denominator

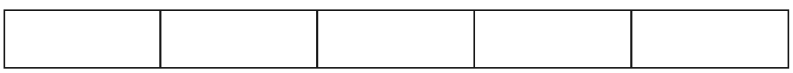
Let's review.

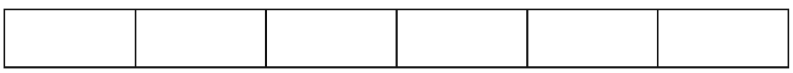
Remember the names of the part of the fraction.

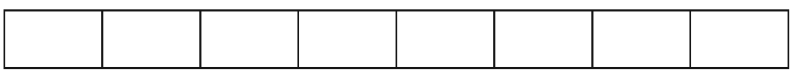
$\frac{3}{4}$ ← ☐

← ☐

1.Colour the following.

$\frac{1}{5}$ 

$\frac{5}{6}$ 

$\frac{3}{8}$ 

2. Put the symbols "<" or">".

(1) $\frac{1}{4}$ ☐ $\frac{3}{4}$ (2) $\frac{2}{5}$ ☐ $\frac{1}{5}$ (3) $\frac{5}{7}$ ☐ $\frac{4}{7}$ (4) $\frac{8}{9}$ ☐ 1

3. Do calculation.

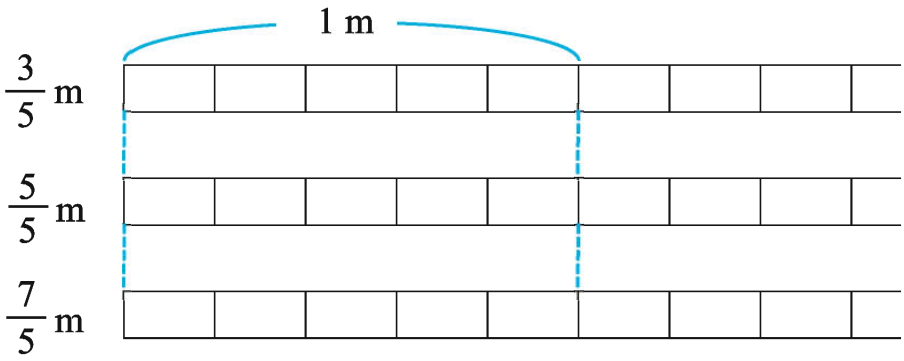
(1) $\frac{1}{3} + \frac{1}{3}$ (2) $\frac{2}{7} + \frac{4}{7}$ (3) $\frac{5}{6} + \frac{1}{6}$ (4) $\frac{3}{10} + \frac{7}{10}$

(1) $\frac{2}{3} - \frac{1}{3}$ (2) $\frac{7}{9} - \frac{5}{9}$ (3) $1 - \frac{2}{3}$ (4) $1 - \frac{7}{10}$

8.2 Fractions smaller than 1, equal to 1, and larger than 1

Let's classify farctions.

Colour the following.



Fractions can be classified like this:

Fractions smaller than 1 (numerator < denominator)	**Fractions equal to 1** (numerator = denominator)	**Fractions larger than 1** (numerator > denominator)
Smaller → 3, Larger → 4	Equal → 4, 4	Larger → 5, Smaller → 4
$\frac{3}{4}, \frac{1}{2}, \frac{2}{3}, \frac{6}{7}$ etc.	$\frac{4}{4}, \frac{2}{2}, \frac{3}{3}, \frac{7}{7}$ etc.	$\frac{5}{4}, \frac{3}{2}, \frac{7}{3}, \frac{10}{7}$ etc.
Proper fraction	**Improper fraction**	

Fractions smaller than 1 are called **proper fractions**, while fractions equal to 1 or larger than 1 are called **improper fractions**.

In grade 4, we will mainly study **proper fraction** and **fraction equal to 1**. We are going to learn fraction larger than 1 in Grade 5.

8.3 Comparison of fraction

Let's find larger fractions and smaller fractions.

Find larger or smaller. Put the symbol "<" or ">".

(1) $\frac{2}{5} \square \frac{3}{5}$

(2) $\frac{3}{8} \square \frac{5}{8}$

Colour and Compare.

Denominators of each pair are equal.

(3) $\frac{1}{2} \square \frac{1}{3}$

(4) $\frac{3}{5} \square \frac{3}{10}$

Numerators of each pair are equal. What do you think?

If the **denominators are the same**, the fraction whose numerator is bigger is larger. (We studied it in Grade 3)
If the **numerators are the same**, the fraction whose denominator is smaller is larger.

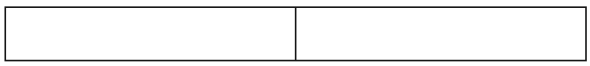
1 Arrange the following from smaller to larger and show it by symbols.

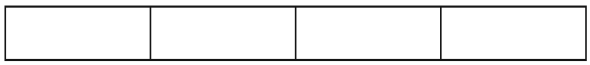
(1) $\frac{2}{3}, \frac{2}{9}, \frac{2}{8}, \frac{2}{5}$ (2) $\frac{3}{7}, \frac{3}{10}, \frac{3}{3}, \frac{3}{5}$ (3) $\frac{5}{10}, \frac{5}{6}, \frac{5}{15}, \frac{5}{9}$

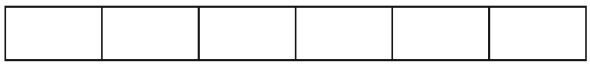
8.4 Equivalent fractions

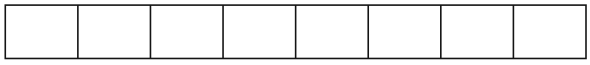
Let's find equivalent fractions and develop its idea.

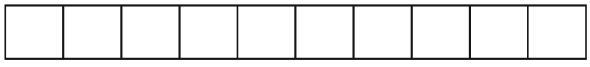
1 Colour and Compare.

$\frac{1}{2}$ 

$\frac{2}{4}$ 

$\frac{3}{6}$ 

$\frac{4}{8}$ 

$\frac{5}{10}$ 

Do you find anything?

$\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{4}{8}$ and $\frac{5}{10}$ are all equivalent fractions.

$$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10}$$

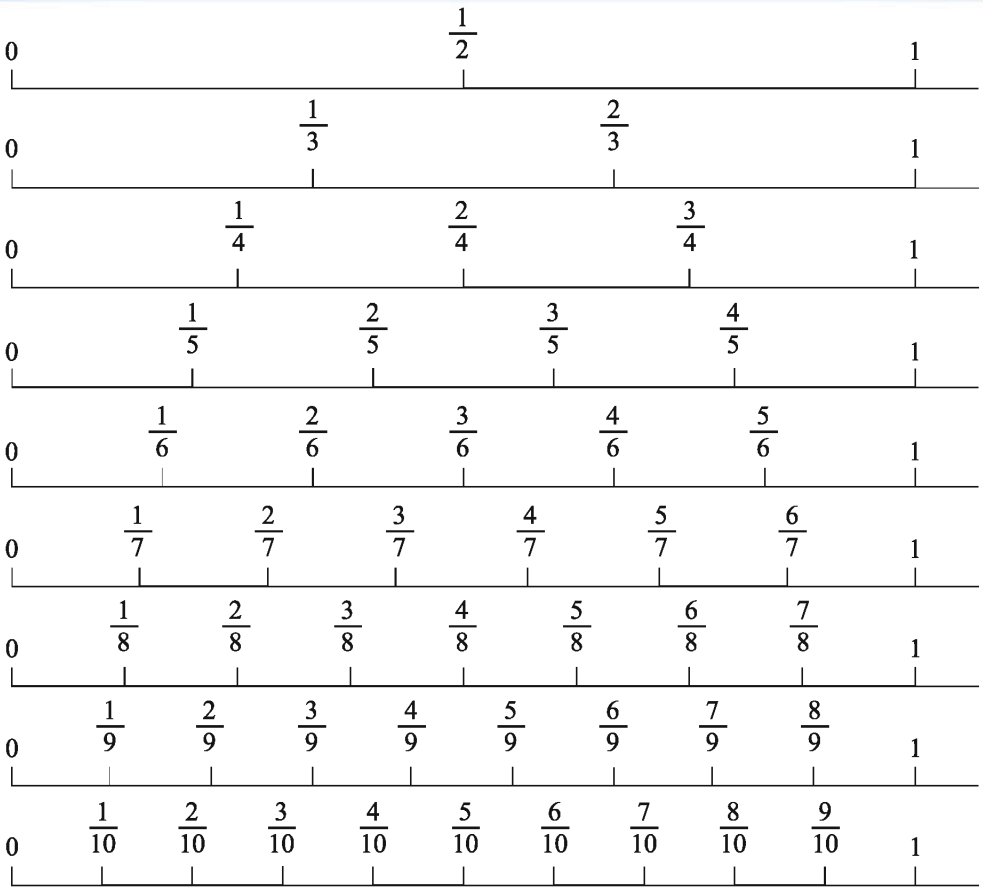
1 Using the number lines in the next page, find equivalent fractions and show it by symbol "=".

There are a lot of equivalent fractions of any fraction!

(1) Find equivalent fraction of $\frac{1}{3}$

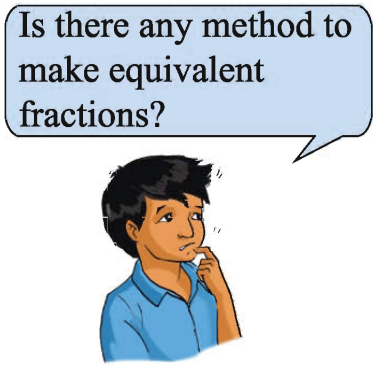
(2) Find equivalent fraction of $\frac{2}{3}$

(3) Find other examples of equivalent fractions.



2 Using the number lines, find the missing numbers.

(1) $\frac{1}{4}=\frac{2}{\square}$ (2) $\frac{4}{10}=\frac{\square}{5}$ (3) $\frac{6}{9}=\frac{\square}{3}$ (4) $\frac{6}{8}=\frac{3}{\square}$



2 Think about how to make equivalent fractions of $\frac{1}{2}$

$$\frac{1}{2} \overset{\times 2}{=} \frac{2}{4} \overset{\times \square}{=} \frac{3}{6} \overset{\times \square}{=} \frac{4}{8}$$

$$\frac{1}{2} \overset{\times 2}{=} \frac{2}{4} \overset{\times \square}{=} \frac{3}{6} \overset{\times \square}{=} \frac{4}{8}$$

Equivalent fractions can be obtained by multiplying numerator and denominator of the fraction by the same number.

$$\frac{\bullet}{\blacksquare} = \frac{\bullet \times \blacktriangle}{\blacksquare \times \blacktriangle}$$

3 Find the missing numbers.

(1) $\frac{1}{2} \overset{\times ?}{=} \frac{\square}{12}$ $\left(\times 6\right)$ (2) $\frac{5}{6} = \frac{10}{\square}$ (3) $\frac{3}{4} = \frac{12}{\square}$ (4) $\frac{7}{8} = \frac{\square}{24}$

4 Make five equivalent fractions of $\frac{2}{5}$ freely.

3 Think about how to make equivalent fractions that are equivalent to $\frac{6}{12}$, like $\frac{3}{6}$, $\frac{2}{4}$, and $\frac{1}{2}$.

$$\frac{6}{12} \overset{\div 2}{=} \frac{3}{6} \overset{\div \square}{=} \frac{2}{4} \overset{\div \square}{=} \frac{1}{2}$$

$$\frac{6}{12} \overset{\div 2}{=} \frac{3}{6} \overset{\div \square}{=} \frac{2}{4} \overset{\div \square}{=} \frac{1}{2}$$

Equivalent fractions can also be obtained by dividing numerator and denominator of the fraction by the same number.

$$\frac{\bullet}{\blacksquare} = \frac{\bullet \div \blacktriangle}{\blacksquare \div \blacktriangle}$$

5 Find the missing numbers .

(1) $\frac{3}{9} = \frac{\square}{3}$ (2) $\frac{6}{8} = \frac{3}{\square}$ (3) $\frac{4}{12} = \frac{1}{\square}$ (4) $\frac{8}{20} = \frac{\square}{5}$

6 Make three equivalent fractions of $\frac{12}{18}$ by dividing numerator and denominator of the fraction by the same number.

If fractions are equivalent, the simpler one is easier…

Dividing the numerator and denominator by the same number in order to make a fraction with a smaller denominator is called **reducing a fraction.**

To reduce a fraction, divide both the numerator and the denominator by a **common factor.**

Oh, 3 is the **common factor** of 15 and 18!

$$\frac{15}{18} \overset{\div 3}{=} \frac{5}{6}$$

$$\frac{\overset{5}{\cancel{15}}}{\underset{6}{\cancel{18}}} = \frac{5}{6}$$

We can do like this as a simple method.

Reduce $\frac{16}{20}$.

$$\frac{16}{20} \overset{\div 2}{=} \frac{8}{10} \overset{\div 2}{=} \frac{4}{5}$$

$$\frac{\overset{4}{\cancel{8}}}{\underset{5}{\cancel{10}}} \quad \frac{\overset{4}{\cancel{16}}}{\underset{5}{\cancel{20}}} = \frac{4}{5}$$

Dividing by 2 and then by 2 is the same as dividing by 4…

And 4 is the **HCF** of 16 and 20.

When reducing fractions, we typically make the denominator as small as possible and get **the lowest term** of the fraction.
we can easily get **the lowest term**, dividing by **the highest common factor (HCF)** of the denominator and the numerator,

Reduce the following fractionsto **the lowest term**.

(1) $\frac{4}{10}$ (2) $\frac{12}{15}$ (3) $\frac{9}{27}$ (4) $\frac{24}{36}$ (5) $\frac{28}{42}$ (6) $\frac{40}{60}$

8.5 Exercise (1)

1. Find proper fractions and fractions equal to 1 in the box.

(1) proper fractions are:

( )

(2) fractions equal to 1 are:

( )

$\frac{2}{3}, \frac{4}{4}, \frac{5}{8}, \frac{8}{5}, \frac{3}{9}, \frac{13}{12}$

$\frac{27}{26}, \frac{1}{1}, \frac{76}{76}, \frac{42}{48}, \frac{2}{25}, \frac{3}{3}$

2. Arrange the followings from smaller to larger and show it by symbols.

(1) $\frac{6}{7}, \frac{3}{7}, \frac{7}{7}, \frac{2}{7}$ (2) $\frac{4}{7}, \frac{4}{5}, \frac{4}{11}, \frac{4}{9}$ (3) $\frac{11}{23}, \frac{11}{13}, \frac{11}{17}, \frac{11}{91}$

3. Find the missing number.

(1) $\frac{1}{3}=\frac{\square}{6}$ (2) $\frac{3}{7}=\frac{\square}{28}$ (3) $\frac{3}{4}=\frac{\square}{36}$ (4) $\frac{4}{5}=\frac{12}{\square}$

(5) $\frac{2}{9}=\frac{16}{\square}$ (6) $\frac{5}{8}=\frac{30}{\square}$ (7) $\frac{3}{6}=\frac{\square}{2}$ (8) $\frac{12}{20}=\frac{\square}{5}$

(9) $\frac{28}{36}=\frac{\square}{9}$ (10) $\frac{33}{66}=\frac{1}{\square}$ (11) $\frac{5}{65}=\frac{1}{\square}$ (12) $\frac{12}{54}=\frac{2}{\square}$

4. Reduce the following fractions to the lowest term.

(1) $\frac{6}{12}$ (2) $\frac{3}{21}$ (3) $\frac{9}{36}$ (4) $\frac{16}{48}$ (5) $\frac{8}{12}$ (6) $\frac{9}{12}$

(7) $\frac{20}{25}$ (8) $\frac{32}{36}$ (9) $\frac{18}{30}$ (10) $\frac{16}{28}$ (11) $\frac{28}{49}$ (12) $\frac{24}{40}$

We have mastered how to make equivalent fractions.

Yes. And we can do a lot of things with this idea. Let's see it in the next sections.

8.6 Finding the common denominator

Let's study about fractions with different denominator.

You have $\frac{2}{3}$ m long red ribbon and $\frac{3}{4}$ m long blue one.

(1) Which is longer ?

Why don't we convert these fractions into the ones with the **common denominator**?

Oh, yes. When the denominators are the same, then the fraction with bigger which numerator is larger.

$$\frac{2}{3}=\frac{4}{6}=\frac{6}{9}=\frac{8}{12}$$
$$\frac{3}{4}=\frac{6}{8}=\frac{9}{12}$$

$$\frac{8}{12}<\frac{9}{12}$$
$$\therefore \frac{2}{3}<\frac{3}{4}$$

Answer: Blue ribbon is longer.

(2) What is the difference?

When we find the difference, we subtract:
"larger number – smaller number" .
But we cannot do $\frac{3}{4}-\frac{2}{3}$. How can we do?

Wait ! Even though we cannot do $\frac{3}{4}-\frac{2}{3}$, we can do $\frac{9}{12}-\frac{8}{12}$.

$$\frac{3}{4}-\frac{2}{3}=\frac{9}{12}-\frac{8}{12}=\frac{1}{12}$$

Answer: the difference is $\frac{1}{12}$ m

Wow, if we convert fractions into the fractions with **common denominator**, that enables us not only find larger or smaller of the fractions but also do subtraction and addition!

OK. Firstly let's study how to find a **common denominator**. And then convert fractions into fractions with common denominator.

Convert $\frac{3}{5}$ and $\frac{2}{3}$ into fractions with common denominators.

$$\frac{3}{5} = \frac{6}{10} = \frac{9}{15} = \frac{12}{20}$$

$$\frac{2}{3} = \frac{4}{6} = \frac{6}{9} = \frac{8}{12} = \frac{10}{15}$$

5, 10, 15, 20...

3, 6, 9, 12, 15...

Do you remember what they were?

Oh! Yes, 15 is the multiple of both 3 and 5. Moreover 15 is also the least common multiples (LCM) of 3 and 5!

To find a common denominator of the fractions at a time:

1. Find a common multiple of the denominators.
2. Convert the fractions so that they have the same denominator.

We typically use the **least common multiples (LCM)** of the original denominators.

Answer: $\left[\frac{3}{5}, \frac{2}{3}\right] \longrightarrow \left[\frac{9}{15}, \frac{10}{15}\right]$

---

1 Convert into fractions with common denominators.

(1) $\left[\frac{1}{3}, \frac{1}{4}\right] \longrightarrow [\quad]$ (2) $\left[\frac{2}{3}, \frac{1}{2}\right] \longrightarrow [\quad]$

(3) $\left[\frac{1}{2}, \frac{2}{5}\right] \longrightarrow [\quad]$ (4) $\left[\frac{1}{3}, \frac{2}{5}\right] \longrightarrow [\quad]$

(5) $\left[\frac{1}{2}, \frac{1}{4}\right] \longrightarrow [\quad]$ (6) $\left[\frac{3}{4}, \frac{5}{6}\right] \longrightarrow [\quad]$

(7) $\left[\frac{7}{9}, \frac{5}{12}\right] \longrightarrow [\quad]$ (8) $\left[\frac{1}{3}, \frac{1}{4}, \frac{1}{2}\right] \longrightarrow [\quad]$

(9) $\left[\frac{1}{2}, \frac{2}{3}, \frac{1}{5}\right] \longrightarrow [\quad]$ (10) $\left[\frac{3}{5}, \frac{3}{4}, \frac{7}{10}\right] \longrightarrow [\quad]$

2 Convert into the fractions with common denominators and compare with the symbols "<" , ">" or "=".

(1) $\frac{7}{9} \square \frac{5}{12}$ (2) $\frac{3}{4} \square \frac{5}{7}$ (3) $\frac{2}{3} \square \frac{6}{9}$ (4) $\frac{11}{16} \square \frac{17}{24}$

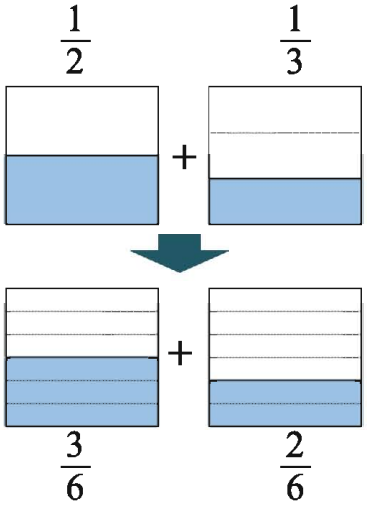
Now, we have mastered how to convert fractions into the fractions with common denominator.

OK, let's apply this idea to addition and subtraction of fractions with different denominators.

8.7 Addition and Subtraction of Fractions

Container A has $\frac{1}{2}$ litre of water. And container B has $\frac{1}{3}$ litre of water. How many litre of water in all?

We are answering total amount, so the operation must be ☐.



Mathematical sentence: $\frac{1}{2} + \frac{1}{3}$

Calculation:

$$\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6}$$

$$= \square$$

Answer: $\frac{5}{6}$ litre.

To add fractions with different denominators, firstly convert fractions into fractions with common denominator and then calculate.

Do addition.

(1) $\frac{1}{4} + \frac{1}{3} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

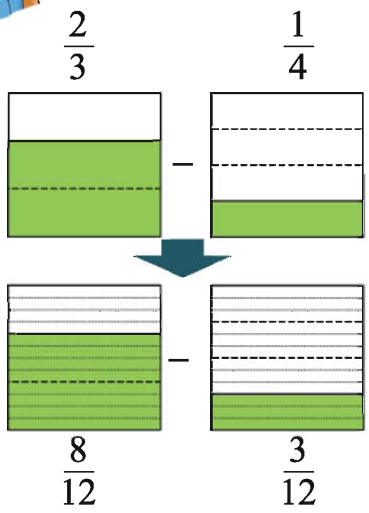
(2) $\frac{1}{4} + \frac{2}{5} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

(3) $\frac{1}{6} + \frac{2}{9} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

(4) $\frac{1}{8} + \frac{5}{6}$

2 You have $\frac{2}{3}$ litre of milk and you've taken $\frac{1}{4}$ litre. How many litre remain?

It's a problem for a remainder, so the operation is ☐.



Mathematical sentence: $\frac{2}{3} - \frac{1}{4}$

Calculation:

$$\frac{2}{3} - \frac{1}{4} = \frac{8}{12} - \frac{3}{12}$$

$$= \square$$

Answer: $\frac{5}{12}$ litre.

To subtract fractions with different denominators, first we convert fractions into the fractions with common denominator and then calculate.

1 Do subtraction.

(1) $\frac{1}{2} - \frac{1}{3} = \frac{\square}{\square} - \frac{\square}{\square} = \frac{\square}{\square}$

(2) $\frac{1}{4} - \frac{1}{5} = \frac{\square}{\square} - \frac{\square}{\square} = \frac{\square}{\square}$

(3) $\frac{2}{3} - \frac{2}{5} = \frac{\square}{\square} - \frac{\square}{\square} = \frac{\square}{\square}$

(4) $\frac{3}{8} - \frac{1}{4} = \frac{\square}{\square} - \frac{\square}{\square} = \frac{\square}{\square}$

(5) $\frac{5}{6} - \frac{3}{8}$

(6) $\frac{7}{10} - \frac{4}{15}$

Do calculation.

(1) $\frac{1}{3}+\frac{1}{6}$

$$\frac{1}{3}+\frac{1}{6}=\frac{2}{6}+\frac{1}{6}=\frac{\overset{1}{\cancel{3}}}{\underset{2}{\cancel{6}}}=\frac{1}{2}$$

(2) $\frac{1}{2}-\frac{1}{6}$

$$\frac{1}{2}-\frac{1}{6}=\frac{3}{6}-\frac{1}{6}=\frac{\overset{1}{\cancel{2}}}{\underset{3}{\cancel{6}}}=\frac{1}{3}$$

If applicable, reduce the fraction to its **lowest term**.

Do addition and subtraction.

We must be careful about not to forget reducing.

(1) $\frac{1}{4}+\frac{3}{20}$ (2) $\frac{1}{4}+\frac{7}{12}$ (3) $\frac{3}{8}+\frac{1}{24}$ (4) $\frac{4}{15}+\frac{1}{12}$ (5) $\frac{8}{15}+\frac{3}{10}$

(6) $\frac{11}{14}-\frac{2}{7}$ (7) $\frac{1}{2}-\frac{1}{6}$ (8) $\frac{5}{6}-\frac{7}{18}$ (9) $\frac{11}{12}-\frac{4}{15}$ (10) $\frac{13}{15}-\frac{9}{20}$

Do calculations with three fractions.

(1) $\frac{1}{6}+\frac{1}{3}+\frac{1}{4}$

$$\frac{1}{6}+\frac{1}{3}+\frac{1}{4}=\frac{2}{12}+\frac{4}{12}+\frac{3}{12}=\frac{\overset{3}{\cancel{9}}}{\underset{4}{\cancel{12}}}=\frac{3}{4}$$

(2) $1-\frac{1}{2}-\frac{1}{4}$

$$1-\frac{1}{2}-\frac{1}{4}=\frac{4}{4}-\frac{2}{4}-\frac{1}{4}=\frac{1}{4}$$

8.8 Exercise (2)

1. Convert into fractions with common denominators and compare with the symbols "<" , ">" or "=".

(1) $\frac{1}{3}\square\frac{1}{5}$ (2) $\frac{3}{4}\square\frac{5}{6}$ (3) $\frac{5}{7}\square\frac{6}{9}$ (4) $\frac{3}{4}\square\frac{12}{16}$ (5) $\frac{3}{24}\square\frac{7}{72}$

2. Do addition.

(1) $\frac{1}{4}+\frac{1}{2}$ (2) $\frac{2}{5}+\frac{3}{7}$ (3) $\frac{1}{6}+\frac{3}{8}$ (4) $\frac{3}{7}+\frac{1}{3}$ (5) $\frac{2}{9}+\frac{5}{12}$

Be careful.

(6) $\frac{5}{6}+\frac{1}{10}$ (7) $\frac{2}{3}+\frac{2}{15}$ (8) $\frac{1}{6}+\frac{2}{15}$ (9) $\frac{4}{15}+\frac{2}{5}$ (10) $\frac{1}{6}+\frac{7}{12}$

Every time after the calculation, we need to check whether reducing is needed or not.

3. Do subtraction.

(1) $\frac{1}{3}-\frac{1}{4}$ (2) $\frac{5}{6}-\frac{2}{5}$ (3) $\frac{1}{3}-\frac{1}{6}$ (4) $\frac{4}{9}-\frac{1}{6}$ (5) $\frac{11}{12}-\frac{7}{9}$

Be careful.

(6) $\frac{9}{10}-\frac{2}{5}$ (7) $\frac{7}{12}-\frac{1}{4}$ (8) $\frac{4}{15}-\frac{1}{6}$ (9) $\frac{2}{3}-\frac{7}{15}$ (10) $\frac{9}{10}-\frac{5}{6}$

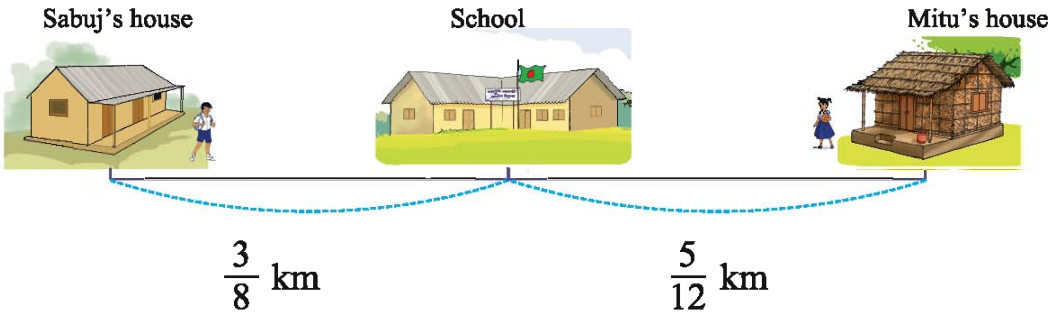
4. Do calculation.

(1) $\frac{1}{3}+\frac{1}{4}+\frac{1}{12}$ (2) $\frac{1}{6}+\frac{1}{3}+\frac{2}{9}$ (3) $\frac{1}{2}-\frac{1}{3}-\frac{1}{9}$ (4) $\frac{3}{4}-\frac{3}{5}+\frac{1}{2}$

5. Do calculation.

(1) $\frac{\square}{3}+\frac{1}{5}=\frac{13}{15}$ (2) $\frac{5}{7}+\frac{\square}{5}=\frac{32}{35}$ (3) $\frac{5}{6}-\frac{\square}{7}=\frac{23}{42}$

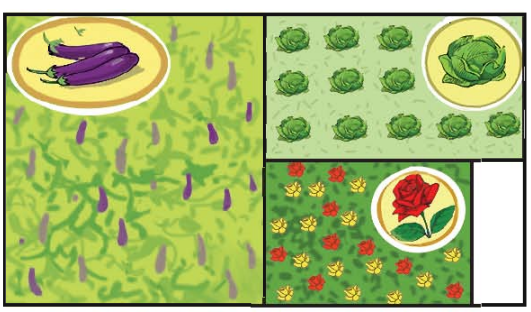
6. Sabuj's house is $\frac{3}{8}$ km to the west of the school. Mitu's house is $\frac{5}{12}$ km to the east of her house.



(1) How many km is it from Sabuj's house to Mitu's house?

(2) Whose house is nearer to school? And how many km is the difference?

7. A farmer planted brinjal in $\frac{1}{2}$ part, cabbage in $\frac{1}{4}$ part and flowers in $\frac{1}{5}$ part of his garden.



(1) How much part of garden did he plant?

(2) How much part of the garden remained blank?

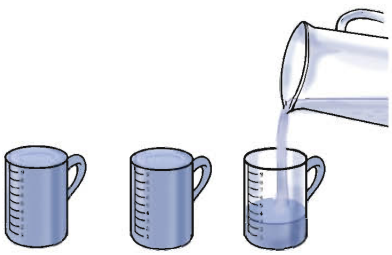
Chapter Nine

Decimals

9.1 Decimals

Let's study another way to represent the fractional amount.

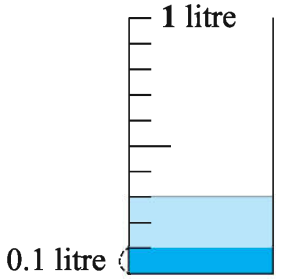
There is some water in a jug. The water is poured into three mugs of one litre each.The third mug is not full as the picture shows. How much water is in the third mug?



When we represent the fractional amount, we often use $\frac{1}{10}$ of the original unit.

The volume of $\frac{1}{10}$ of 1 litre is "**0.1** litre", and written and read "**zero point one** litre" in words.

$$\textbf{0.1 litre} = \frac{1}{10} \text{ litre}$$



The third mug contains $\frac{3}{10}$ litre.

$\frac{3}{10}$ litre is **three times of 0.1** litre, so it's **0.3** litre.

In the jug, there was **2 litres and 0.3 litre** of water which can be represented by **2.3 litres** and read **two point three** litres in words.

Numbers such as 0.1, 0.3, 2.3 and so on are called **decimals** and "." is called a **decimal point**.

Name of the place	one	tenths
	2	3
How to read	two point	three

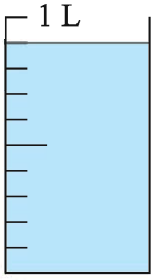
The place to the right of the decimal point is called:

the **tenths place** ($\frac{1}{10}$ s place).

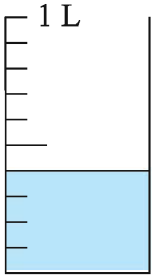
In contrast, numbers which we have studied such as 0, 1, 2, and so on, without fractional part, are called **integers**.

1 Represent the following volumes using decimals and write in words.

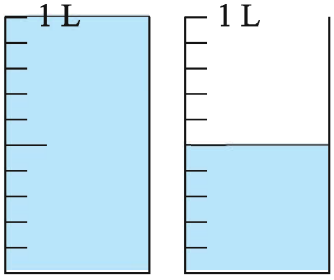
(1)



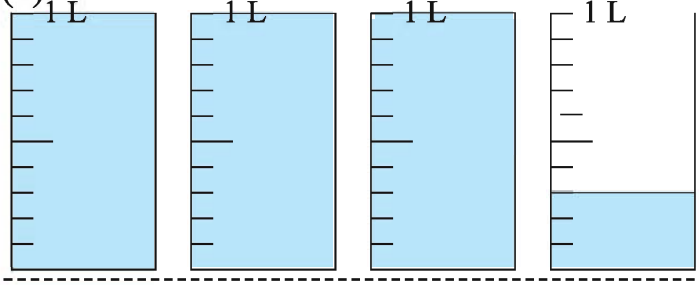
(2)



(3)



(4)



Remember that "L" is short for "litre."

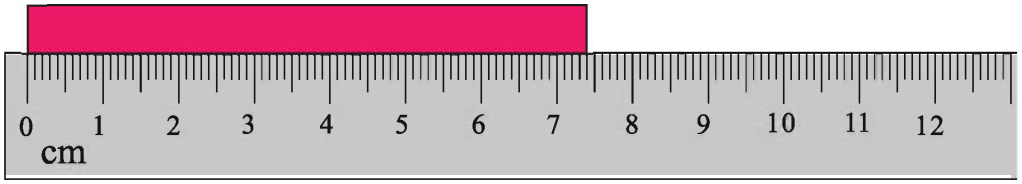
2 Classify these numbers in decimals and integers

0.6 1.7 2
4 11.3 36.8

Decimals	
Integers	

2 How many centimetres is the length of the red tape?

Remember that "cm" is short for "centimetre" and "mm" is short for "millimetre."



(1) What is the length of the tape? ____ cm ____ mm

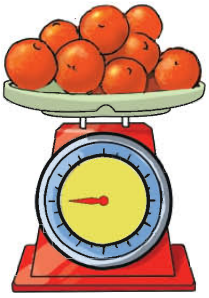
(2) How many cm is 1 mm? ____ cm

1 mm is $\frac{1}{10}$ **cm** so…

(3) How can you write 4 mm in cm? ____ cm

(4) How can you write 7 cm 4 mm in cm? ____ cm

3 The weight of the oranges is 1 kilogram 500 gram. How many kilograms is the weight of the oranges?



"kg" is short for "kilogram" and "g" is short for "gram."

(1) How can you write 100g in kg? ____ kg

Remember that 1000 gram is equivalent to 1 kilogram.

(2) How can you write 500g in kg? ____ kg

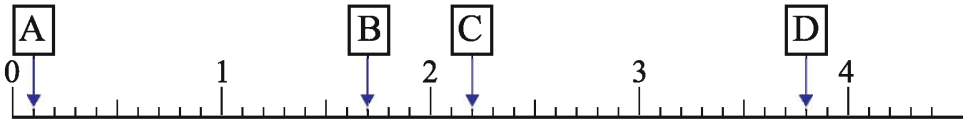
(3) How can you write 1kg 500g in kg? ____ kg

We use decimals in many situation in our daily life. Let's learn much about decimals.

9.2 Size of decimals

Let's compare the size of decimals.

1. What numbers are represented for A, B, C and D on the number line?



2. Put these numbers on the number line above.

0.9, 0.5, 2.6, and 3.2

3. How many 0.1s are consist in 0.5, 1.8 and 3.3?

4. Answer the following questions.

a) Write the number made of twenty five 0.1s.

b) Write the number made of twenty 0.1s.

c) How many 0.1s make 3.2?

d) How many 1s and 0.1s make 3.2?

"2.0" can be expressed as "2."

5. Which is larger 2.1 or 1.3?

Rita

I put these numbers on the number line to compare their size. The number put on the right is larger.

2.1 is made of twenty-one 0.1s.
1.3 is made of thirteen 0.1s. So, 2.1 > 1.3.

Jogen

1 Which is larger? Write < or >.

(1) 2.4 ☐ 1.8 (2) 3 ☐ 0.8 (3) 7.1 ☐ 6.8 (4) 0 ☐ 0.1

Which is larger, $\frac{2}{10}$ or 0.3?

Oh…how can we compare fractions and decimals?

I think about the number of 0.1s

I think about the number of $\frac{1}{10}$ s.

$\frac{2}{10}$ is made of two 0.1s.

0.3 is made of three 0.1s.

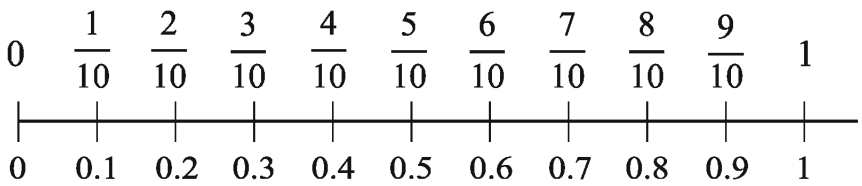
$\therefore \frac{2}{10} < 0.3$

$\frac{2}{10}$ is made of two $\frac{1}{10}$.

0.3 is made of three $\frac{1}{10}$ s.

$\therefore \frac{2}{10} < 0.3$

Let's clarify the relation between common fractions and decimals on the number line.



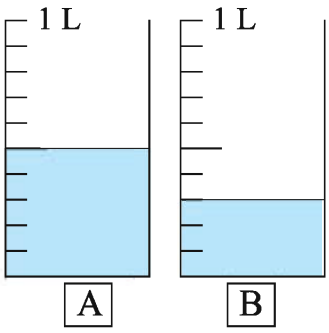
1 Which is larger? Represent with Relation Symbols (<, > or =).

(1) $\frac{8}{10}$ ☐ 0.7 (2) 0.3 ☐ $\frac{3}{10}$ (3) 0.1 ☐ $\frac{3}{10}$ (4) $\frac{10}{10}$ ☐ 0.9

9.3 Addition and Subtraction of Decimals (1)

Let's try addition and subtraction of decimals.

Container A has 0.5 litre of water. And container B has 0.3 litre of water.



(1) How many litre of water in all?

To find total amount, we choose [ ].

Mathematical sentence is: _____

Let's think about how many 0.1s are there in the numbers.

Calculation is…

0.5 is made of five 0.1s and 0.3 is made of three 0.1s.
In all, there are (5 + 3) 0.1s. ∴ The answer is: 0.8 litre

(2) How much more water in A than B?

To find difference in the amount of water, we choose [ ].

Mathematical sentence is: _____

Calculation is…

(five 0.1s) − (three 0.1s) So difference is (5 − 3) 0.1s.
∴ The answer is: 0.2 litre

1 Do addition and subtraction.

(1) 0.3 + 0.4 (2) 0.7 + 0.2 (3) 0.5 + 0.5 (4) 0.9 + 0.3

(5) 0.8 − 0.6 (6) 0.7 − 0.2 (7) 1 − 0.3 (8) 1.6 − 0.4

As we see, if we think about how many 0.1s are there in the numbers, we can calculate in almost the same way as of integers.

So we can do vertical calculation!

	1	.	9
+	2	.	3
	4	.	2

	2	.	4
−	0	.	6
	1	.	8

Yes, and it's important to line up the places properly.

The rules of the vertical calculation:

1. Line up the places vertically.
2. Calculate in the same way as addition and subtraction of integers.
3. Place a decimal point in the answer, lining it up with the decimal points above.

And we must be careful about some more points.

Do addition and subtraction.

(1) 1.3 + 2.7

✓
$$\begin{array}{r} 1.3 \\ +\ 2.7 \\ \hline 4.0 \end{array}$$

1.3 + 2.7 = 4.0
But we write it just 4.
✓1.3 + 2.7 = 4

(2) 7 + 5.5

✗
$$\begin{array}{r} 7 \\ +\ 5.5 \\ \hline 6.2 \end{array}$$

✓
$$\begin{array}{r} 7.0 \\ +\ 5.5 \\ \hline 12.5 \end{array}$$

Think about 7 as 7.0.

(3) 5 − 0.3

✗
$$\begin{array}{r} 5 \\ -\ 0.3 \\ \hline 0.2 \end{array}$$

✓
$$\begin{array}{r} 5.0 \\ -\ 0.3 \\ \hline 4.7 \end{array}$$

Think about 5 as 5.0.

(4) 3.6 − 2.8

$$\begin{array}{r} 3.6 \\ -\ 2.8 \\ \hline \text{✗}\ 0.8 \end{array}$$

$$\begin{array}{r} 3.6 \\ -\ 2.8 \\ \hline \text{✓}\ 0.8 \end{array}$$

Don't forget to put "." and "0" in ones place.

9.4 Exercise (1)

1. Which is larger? Represent with Relation Symbols (<, > or =).

(1) 0.4 ☐ 0.7 (2) 5.6 ☐ 6.5 (3) 0.1 ☐ 0 (4) 11 ☐ 1.1

(5) $\frac{5}{10}$ ☐ 0.5 (6) 0.7 ☐ $\frac{3}{10}$ (7) 0.1 ☐ $\frac{1}{10}$ (8) $\frac{10}{10}$ ☐ 1

2. Do addition and subtraction.

(1) 0.6 + 0.4 (2) 0.8 + 0.5 (3) 0.6 + 0.7 (4) 1.8 + 0.2

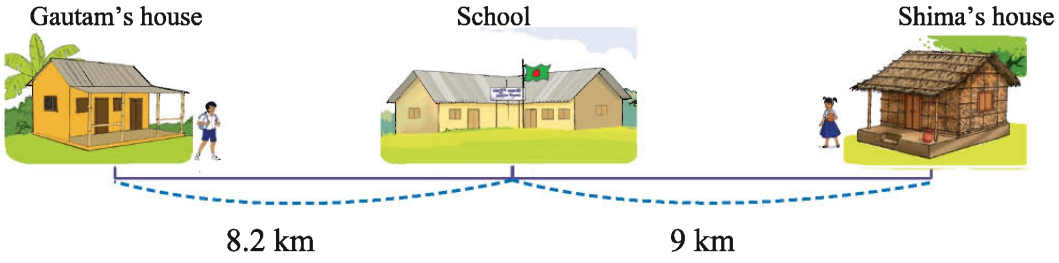
(5) 0.7 − 0.4 (6) 1 − 0.2 (7) 1.2 − 0.3 (8) 2 − 0.4

3. Do verticalcalculation.

(1) 1.2 + 3.6 (2) 2.8 + 1.5 (3) 4.7 + 3.9 (4) 3 + 6.8 (5) 4.1 + 3.9

(6) 3.4 − 1.3 (7) 5 − 2.8 (8) 7.6 − 1.6 (9) 6.3 − 5.5 (10) 9.1 − 8.9

4. Gautam's house is 8.2 km to the west of the school. Shima's house is 9 km to the east of her house.



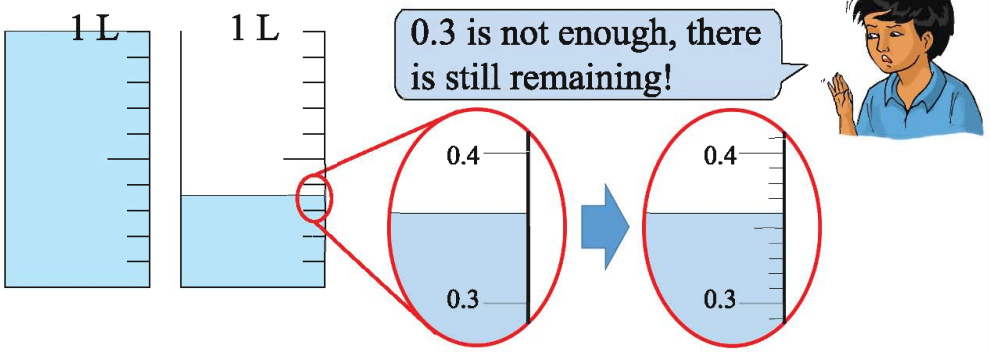
(1) How many kilometre is it from Gautam's house to Shima's house?

(2) How many kilometre is the distance from school to Shima's house than the distance from school to Gautam's house?

9.5 Hundredths and Thousandths place

Let's study how to represent the smaller decimal.

How can we represent the following amount of water?



We need to divide 0.1 litre into 10 equal parts.

$\frac{1}{10}$ of **1** litre —— **0.1** litre

$\frac{1}{10}$ of **0.1** litre —— **0.01** litre(**zero point zero one** litre)

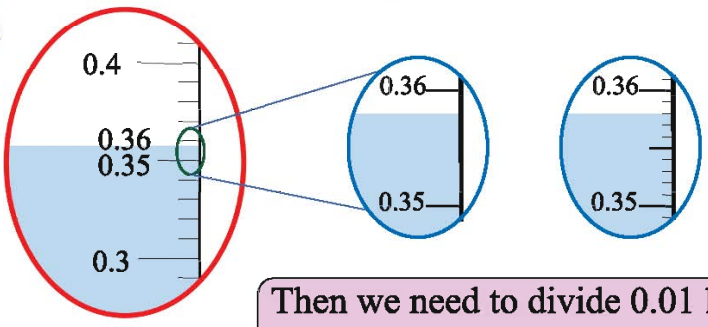
And **0.01** litre is $\frac{\mathbf{1}}{\mathbf{100}}$ of **1** litre.

Total amount is:

one	1	litre ——		litre
three	0.1s	litre ——		litre
six	0.01s	litre ——		litre
			1 . 3 6	litre

(one point three six litre)

Then what if there is much smaller amount? For example…



Then we need to divide 0.01 litre into 10 equal parts.

$\frac{1}{10}$ of **0.01** litre —— **0.001** litre **(zero point zero zero one** litre)

And **0.001** litre is $\frac{1}{1000}$ of 1litre.

In this case,
there are **eight 0.001** litre. So
Total amount is: 1.358 litre

Name of the place	one	tenth ($\frac{1}{10}$ s)	**hundredths** ($\frac{1}{100}$ s)	**thousandths** ($\frac{1}{1000}$ s)
	1	**3**	**5**	**8**
How to read	one	point three	five	eight

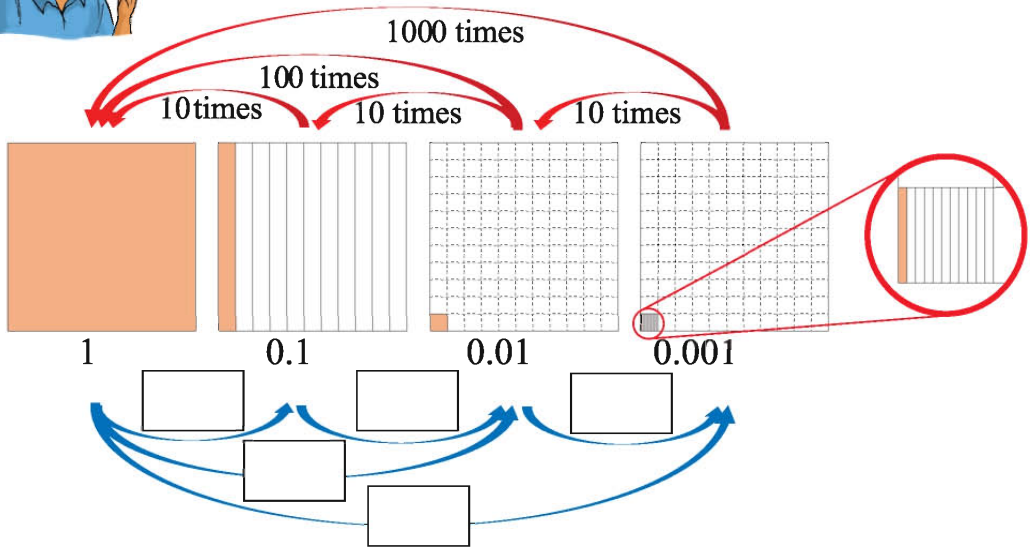
The place to the right of the **thenths place** is called:

the **hundredths place** ($\frac{1}{100}$ s place).

The place to the right of the **hundredths place** is called:

the **thousandths place** ($\frac{1}{1000}$ s place).

Let's see the relation among 1, 0.1, 0.01, and 0.001.



Each numeral in the decimal has a fixed place and is 10 times of the right or $\frac{1}{10}$ of the left.

How many 1s, 0.1s, 0.01s, and 0.001s are combined in these numbers

(1) 1.469 (2) 3.825 (3) 0.017

1.469 combines		3.825 combines		0.017 combines	
one	1s		1s		1s
four	0.1s		0.1s		0.1s
	0.01s		0.01s		0.01s
	0.001s		0.001s		0.001s

1. How many 0.01s are combined to make these numbers?

(1) 0.23 (2) 4.23 (3) 8.07 (4) 11.46 (5) 11.4

Let's think about how many 0.01s are there in the numbers.

Three 0.01s is 0.03…
Twenty-three 0.01s is 0.23…
Four hundred and twenty-three 0.01s is 4.23…

2. How many 0.001s are combined to make these numbers?

(1) 0.015 (2) 0.478 (3) 2.075 (4) 4.23

Be careful.

1 Answer the questions.

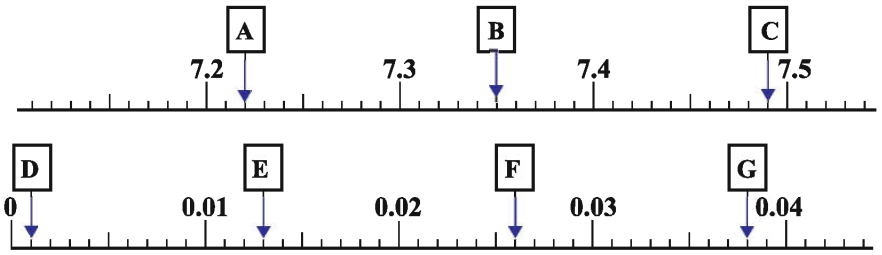
a) Write the number made of one hundred and fifty-five 0.01s.

b) Write the number made of one hundred and fifty-five 0.001s.

c) How many 0.01s make 6.82?

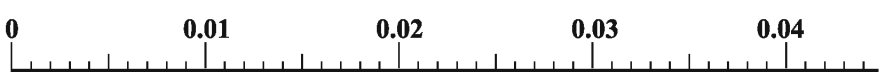
d) How many 0.001s make 6.82?

2 1. What numbers are represented for A to G on the number line?



2. Represent these numbers on the number line.

0.001, 0.015, 0.027, 0.034



4 Multiply 0.56 by 10 and 100. And also divide it by 10.

0.56 is made by combining fifty six 0.01s. So…

10 times 0.56 equals to:
56 of 10 times 0.01 ➡ 56 of 0.1 ➡ 5.6

100 times 0.56 equals to:
56 of 100 times 0.01 ➡ 56 of 1 ➡ 56

0.56 divided by 10 equals to:
56 of 0.01 divided by 10 ➡ 56 of 0.001 ➡ 0.056

tens	ones	tenths ($\frac{1}{10}$)	hundredths ($\frac{1}{100}$)	thousandths ($\frac{1}{1000}$)
5	6			
	5	6		
	0	5	6	
	0	0	5	6

10 times, 10 times (100 times), $\frac{1}{10}$

Each place in a decimal number increases by one place when you multiply by 10 and decreases by one place when you divide by 10.

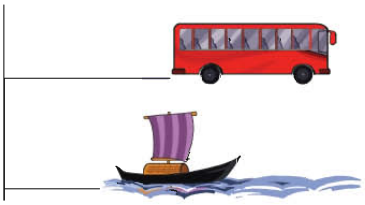
3 Multiply the following numbers by 10. And also divide them by 10.

(1) 0.6 (2) 0.49 (3) 1.11 (4) 7.32

9.6 Addition and Subtraction of Decimals (2)

Let's try calculation with hundredths and thousandths place.

1 Samson traveled 5.52 kilometre by bus and 2.65 kilometre by boat. How much total path did he travel?



To find total amount, the operation is ☐ .

Mathematical sentence: _____

Let's think about how many 0.01s are there in the numbers.
We can calculate in almost the same way as of integers.

Calculation is…

$$\begin{array}{r} 5.52 \\ +\ 2.65 \\ \hline 8.17 \end{array}$$

Answer: 8.17 kilometer

2 Hasan's bag weighs 4.8 kilogram and Ripa's weighs 3.59 kilogram.
What is the difference in weight in kilogram?

When we find difference we use ☐ .

Mathematical sentence: _____

Line up the places. And Think about 4.8 as 4.80.

Calculation

$$\begin{array}{r} 4.80 \\ -\ 3.59 \\ \hline 1.21 \end{array}$$

Answer: 1.21 kilograms difference

Do addition and subtraction carefully.

(1) 4.06 + 2.94

✔4.06
+2.94
7.00

4.06 + 2.94 = 7.00
But we write it just 7.
✔4.06 + 2.94 = 7

(2) 6 + 4.85

× 6
+4.85
4.91

✔6.00
+4.85
10.85

Think about 6 as 6.00.

(3) 4 − 2.31

× 4
−2.31
2.33

✔4.00
−2.31
1.69

Think about 4 as 4.00.

(4) 3.75 − 0.5

3.75
− 0.5
× 3.70

3.75
−0.50
✔3.25

Think about 0.5 as 0.50.

(5) 7.58 − 6.87

7.58
−6.87
× 71

7.58
−6.87
✔0.71

Don't forget to put "." and "0" in ones place.

Do vertical calculations.

(1) 3.27 + 2.51

(2) 0.28 + 6.72

(3) 4.07 + 3.6

(4) 3.141 + 5.379

(5) 5.47 − 3.25

(6) 8.26 − 3.4

(7) 4. − 2.25

(8) 7.652 − 6.648

9.7 Decimal and Fraction

Let's try to converse dicemals and fractions each other.

Express 0.3, 0.15, and 0.008 as fractions.

$0.3 = \frac{\square}{10}$

$0.15 = \frac{\square}{100}$

$0.008 = \frac{\square}{1000}$

We have studied,

$0.1 = \frac{1}{10}$

$0.01 = \frac{1}{100}$,

$0.001 = \frac{1}{1000}$

We can express decimals as fractions by using 10, 100, 1000 and so on in the denominator.

Then if applicable, reduce the answer to get the lowest term.

$$0.15 = \frac{\overset{3}{\cancel{15}}}{\underset{20}{\cancel{100}}} = \frac{3}{20} \qquad 0.008 = \frac{\overset{1}{\cancel{2}}}{\underset{125}{\cancel{250}}} = \frac{1}{125}$$

1 Convert the decimals into fractions. And if applicable, reduce the answer to get the lowest term.

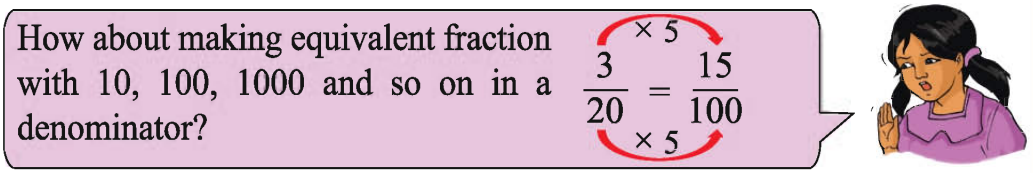
(1) 0.55 (2) 0.04 (3) 0.75 (4) 0.25

Then I think we can also express fractions as decimals with the same way, by using 10, 100, 1000 and so on in the denominator.

1. Express $\frac{3}{10}$, $\frac{27}{100}$, $\frac{341}{1000}$ as decimals.

$\frac{3}{10} = 0.3$ $\frac{27}{100} = 0.27$ $\frac{341}{1000} = 0.341$

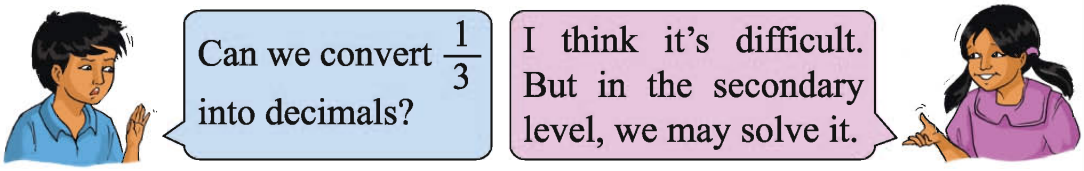
2. Express $\frac{3}{20}$, $\frac{7}{25}$, $\frac{17}{50}$ as decimals.



$\frac{3}{20} = \frac{3 \times 5}{20 \times 5} = \frac{15}{100} = 0.15$

$\frac{7}{25} = \frac{7 \times 4}{25 \times 4} = \frac{28}{100} = 0.28$

$\frac{17}{50} = \frac{17 \times 2}{50 \times 2} = \frac{34}{100} = 0.34$



We can express fractions as decimals by using 10, 100, 1000 and so on in the denominator, but not for all the fractions.

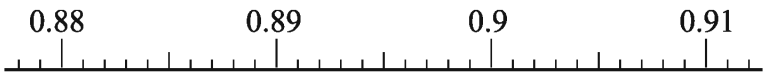
2 Convert the fractions into decimals.

(1) $\frac{7}{20}$ (2) $\frac{11}{25}$ (3) $\frac{37}{50}$ (4) $\frac{1}{4}$

9.8 Exercise (2)

1. Represent these numbers on the number line.

0.881, 0.889, 0.895, 0.899, 0.901



2. How many 0.001s are combined to make these numbers?

(1) 0.031 (2) 0.296 (3) 1.047 (4) 1.03

3. Multiply the following numbers by 10. And also divide them by 10.

(1) 0.6 (2) 0.49 (3) 1.11 (4) 7.32

4. Do vertical calculation.

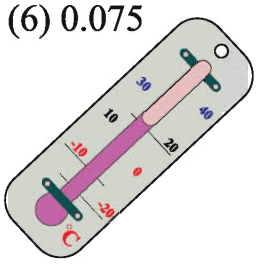
(1)	(2)	(3)	(4)	(5)
3.57	4.38	6.25	0.82	3.079
+1.24	+3.7	+1.55	+2.39	+0.921

(6)	(7)	(8)	(9)	(10)
5.38	8.65	7.2	9	1.467
−2.19	−0.7	−5.37	−0.42	−0.397

5. Convert the fractions into decimals and decimals into fractions. If possible, reduce the fraction to get the lowest term.

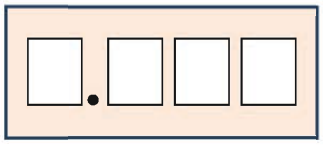
(1) $\frac{3}{25}$ (2) $\frac{17}{50}$ (3) $\frac{3}{4}$ (4) 0.6 (5) 0.25 (6) 0.075

6. Yesterday's highest temperature was 32.55 degrees Celsius and today's was 28.87 degrees. Find the difference?



7. You have following four cards and make decimals using the format on the right.

1	3	5	0



(1) What is the largest number you can make?
(2) What is the smallest number you can make?

Chapter Ten

Measurement

10.1 Length and Perimeter

Let's convert the unit of lengths: km, m ,cm, and mm.

Let's review relation among the unit of length.

km (kilometre)	m (metre)	cm (centimetre)	mm (millimetre)
1 km =	1000 m		
	1 m =	100 cm	
		1 cm =	10 mm
			1 mm

The height of Monindra Tripura is 1 m 42 cm

(1) Express in "cm."

1 m =100 cm ∴1 m 42 cm = **142 cm**

(2) Express in "m."

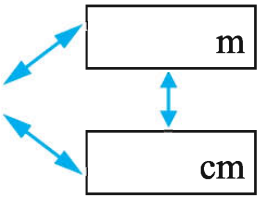
10 cm = 0.1 m → 40 cm = 0.4 m

1 cm = 0.01 m → 2 cm = 0.02 m

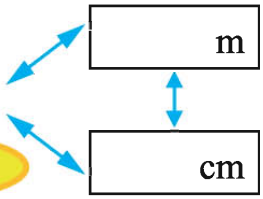
∴1 m 42 cm = **1.42 m**

Express these lengths in "m" and "cm."

3 m 78 cm

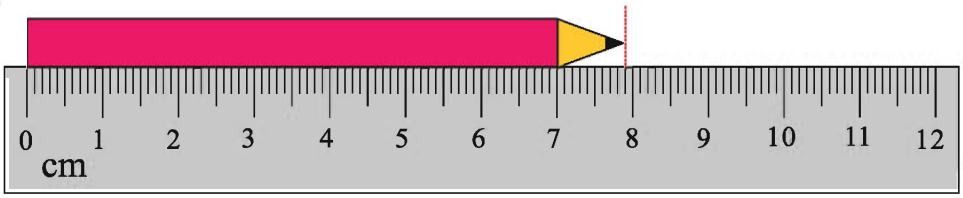


2 m 6 cm



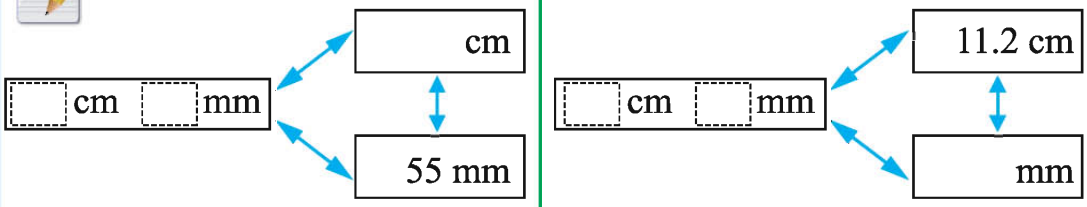
Be careful.

2 Express the length of the pencil in "cm" and "mm".



Answer7.9 cm / 79 mm

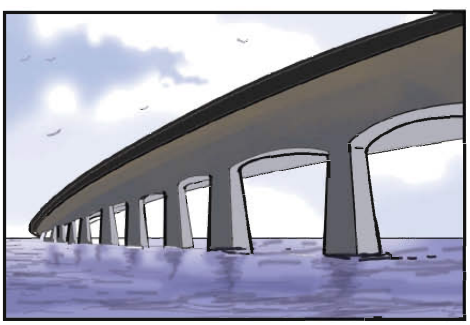
2 Express these lengths in "cm," "mm," and in both.



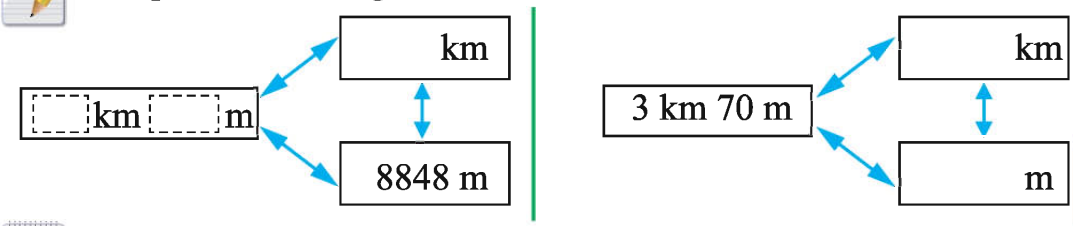
3 Measure different objects from your surrounding environment (e.g. book, stick, table, brick,etc.) and express in "m," "cm," and "mm."

3 Express 3796 metre in "km."

3000 m	=	☐ km
700 m	=	0.7 km
90 m	=	☐ km
6 m	=	0.006 km
∴ 3796 m	=	**3.796 km**



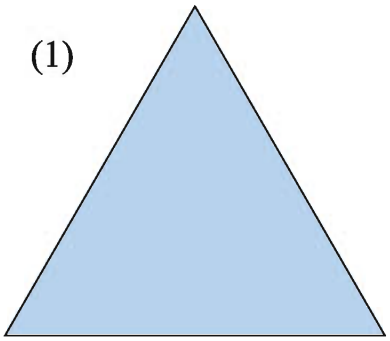
4 Express these lengths in "km," "m," and in both.



5 For a marathon, a runner runs 42.195 km. Express 42.195 km in "m."

4 Measure the total length of the sides of each shape using cm scale.

(1)

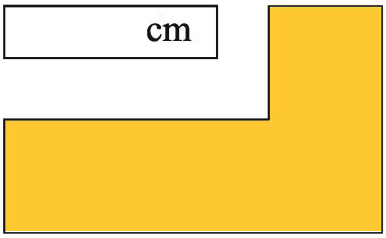


cm

(2)

cm

(3)

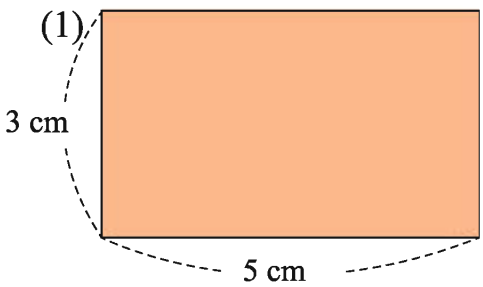


cm

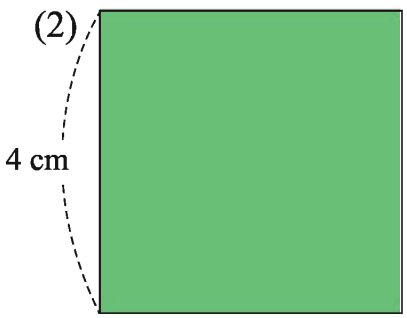
The total distance around the edge of the figure is called **perimeter.**

5 Find the perimeter of the following rectangular and square.

(1)



(2)



I remember that the opposite sides of a rectangle have the same length.

And four sides of a square have the same length.

$(3 + 5) \times 2 =$ ☐

cm

$4 \times 4 =$ ☐

cm

6 Measure and calculate perimeter of the shapes around you.

10.2 Weight

Let's convert the unit of weight: kg and g.

kg (kilogram)		g (gram)
1 kg	=	1000 g

This back pack weighs 8245g. Let's convert the unit of weight from g into kg.

8000 g = 8 kg

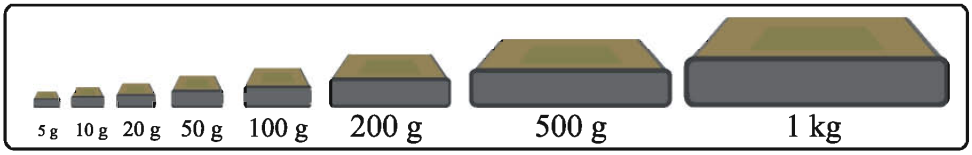
200 g = ☐ kg

40 g = 0.04 kg

5 g = ☐ kg

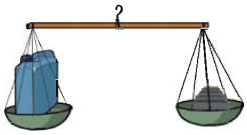
∴ 8245 g = **8.245 kg**

You weigh something with a set of standard weights.



How heavy are they? Express in "kg" and "g"

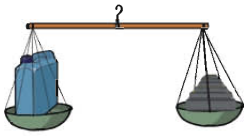
(1)



500 g, 200 g, 50 g, 10 g

kg	
g	

(2)



1 kg, 500 g, 200 g, 100 g, 20 g, 10 g, 5 g

kg	
g	

Express the weights in "kg," "g," and in both.

☐ kg ☐ g

5.062 kg

g

10 kg 900 g

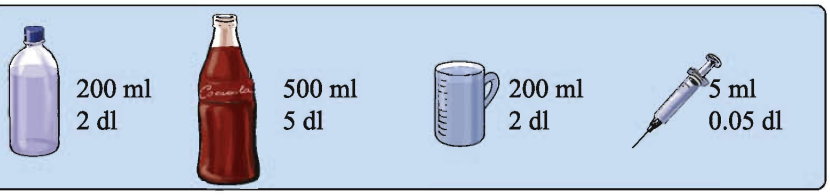
kg

g

10.3 Volume of liquid

Let's learn a new unit of volume of liquid and use it.

To weigh small amount of liquid, we use "deciliter (dl)" and "millilitre (ml)."



L (litre)	dl (deciliter)	ml (millilitre)
1 L =	10 dl =	1000 ml
	1 dl =	100 ml

We also use "cc" as unit of volume of liquid.

1cc = 1ml

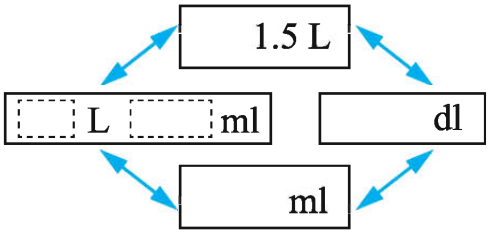
(cc = cubic centimeter)

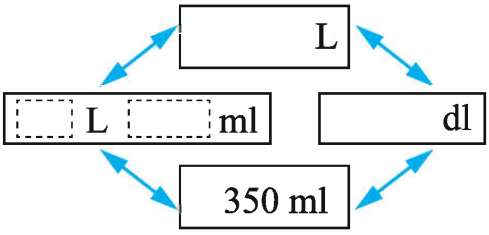
Kazol bought 1L of milk and drank 250 ml of it. How much milk remains?

1L = 1000 ml
So
1000 − 250 = 750
Answer: **750 ml**

250 ml = 0.25 L
So
1 − 0.25 = 0.75
Answer: **0.75 L**

Both are OK. Dipika thinks in **millilitre** and Arun thinks in **litre**. Express these volume in "L," "ml," in both and "dl".





10.4 Exercise (1)

1. Fill in the blank boxes.

(1) 8 mm = ☐ cm

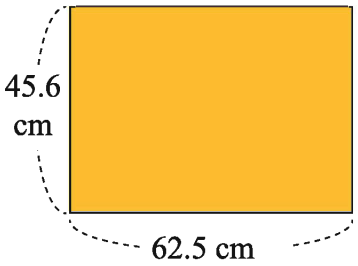
(2) 4.2 km = ☐ m

(3) 5.45 L = ☐ ml = ☐ dl

(4) 3 m 7 cm = ☐ cm

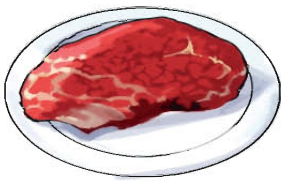
(5) 600 g = ☐ kg

2. Length and width of the surface of Apu's desk are 45.6 cm and 62.5 cm. How long is the perimeter of the table? Express in "cm" and "m."



cm	m

3. Hasan bought 1.5 kg of meat for his family. After that they ate some of them, 895 g remains. How much meat did they eat? Express in "kg" and "g."



kg	g

4. Shampa drank 340 ml of water for breakfast, 380 ml for lunch, and 300 ml for dinner. How much water did she drink in total? Express in "ml" , "dl" and "L."

ml	dl	L

5. The distance from Arun's house to his uncle's is 9.8 km. He walks 950 m to the bus stop. Then he moves 6.5 km on a bus. How long remains to go to uncle's house? Express in "km" and "m."

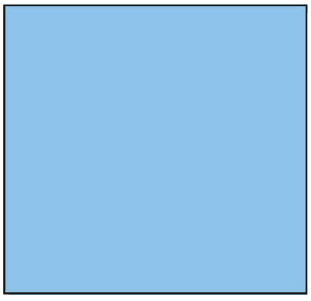
km	m

10.5 Area

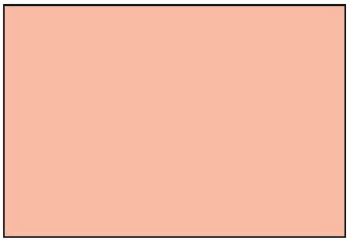
Let's think about how to describe size of the surface.

Which is larger, A or B? How do you compare?

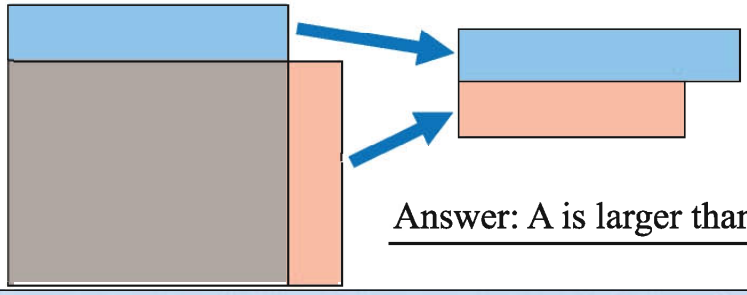
A



B

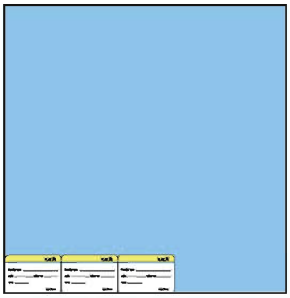


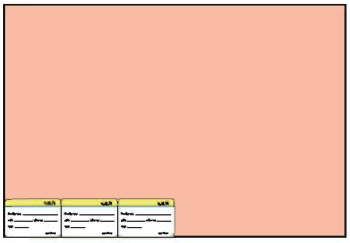
Um…the basic way is cut out them or trace them on a piece of thin paper, then overlap them to compare.



Answer: A is larger than B.

If we cannot cut out or trace them, we can spread something on the surface and compare on the basis of how amount of place that object occupies

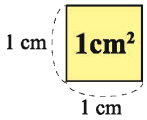




Yes, but I don't think "these" are enough. We need a specific unit of international standard.

The amount of space inside the boundary of a flat object is called "**area**". Area is expressed in terms of the **number of squares with 1 cm on each side.**

The area of square with 1 cm each side is called **1 square centimeter** and written as **1cm²**.
cm² is a unit of area.



1 cm²

We can spread squares of 1cm² on the surface and count the number to find the area.

Yes. But we can also think about it with the graph paper spacing of 1 cm 1cm.

Which is larger, A or B? How many cm² is the difference?

1cm

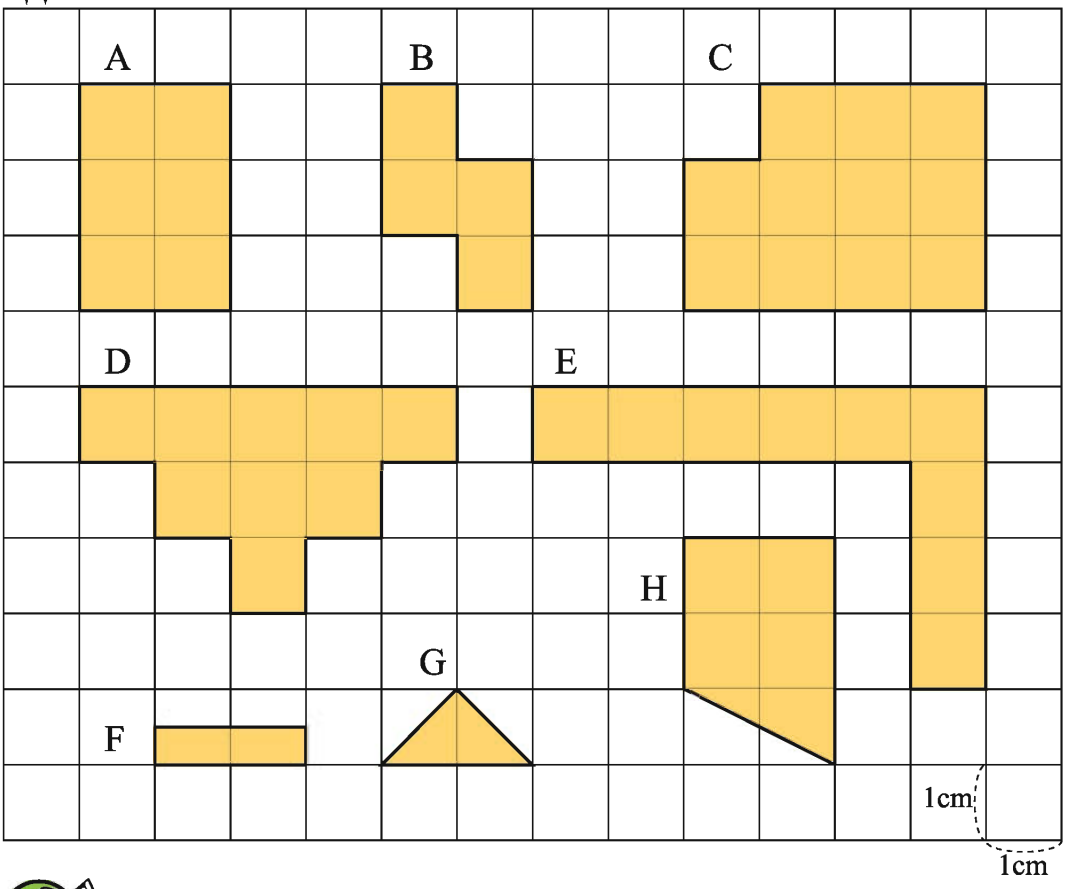
	A						B					1cm	
	1	6											
	2						1	5					
	3						2	6					
	4						3						
	5						4						

The area of A is [25] 1 cm², so it's area is [ ] cm².

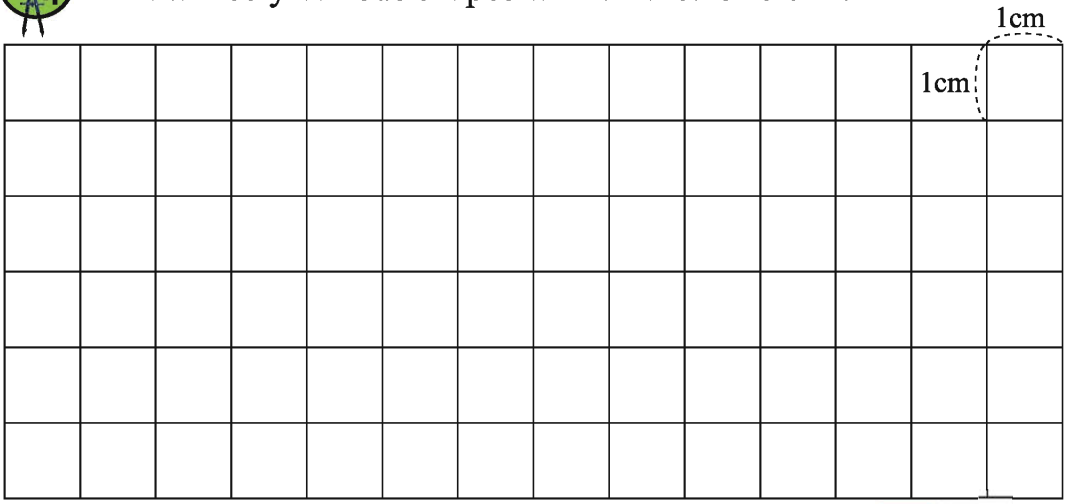
The area of B is [ ] 1 cm², so it's area is [ ] cm².

Answer: [ ] is bigger than [ ] by [ ] cm²

3 What is the area of each of the shapes below in cm^2.

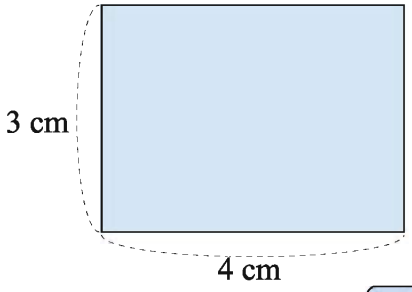


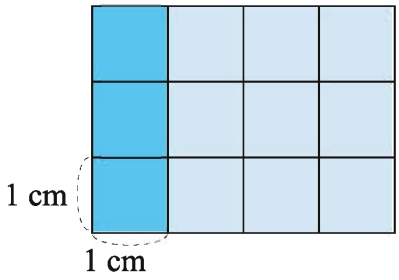
4 Draw freely various shapes with an area of 8 cm^2.



We count the number of squares of 1cm² to figure out the area. So, I think some area can be found with calculation.

5 Think about how to find the area of following rectangle with calculation.

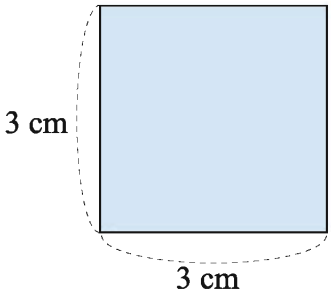




There are 4 columns of 3 squares stacked vertically.

Mathematical sentence is: ☐ × ☐ = ☐ Answer is: ☐ cm²

6 Find the area of following square with calculation.



Mathematicl sentence is: _____

Area of the square is: _____ cm²

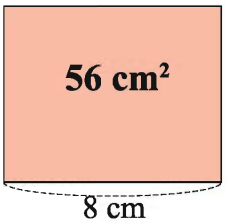
The formulas for finding the area of rectangles and squares are below:

Area of a rectangle = length × width

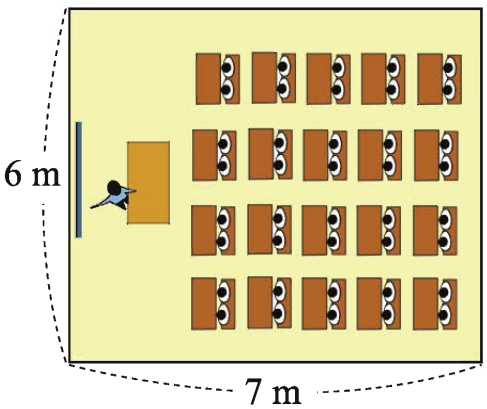
Area of a square = 1 side × 1 side

1 Find the area using the formula.
(1) The rectangle of 21 cm long and 15cm wide.
(2) The square with 10 cm sides.

2 What is the width of the rectangle on the right?



7 This is the size of Ripa's classroom. Find the area of the floor.



Let's use the formula. But before the calculation, we need to convert the unit.

6 m= 600 cm

7 m = 700 cm

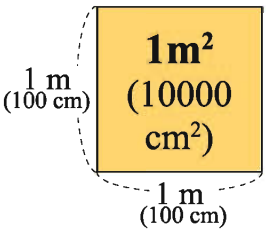
Area is: 600 × 700 = 420000

Answer: 420000 cm²

But the number is quite large…

Wow, great! You're right, and mentioned good point, Reza!
In this case, we can use another unit.

We can use the area of a square with **1 m** sides.
It is **1 square metre**, and written as **1m²**.
m² is a basic unit of area.



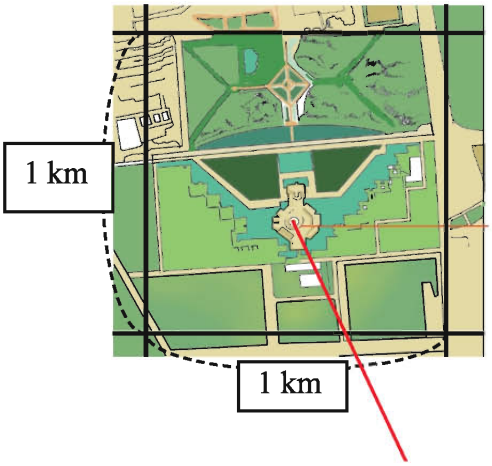
Mathematical sentence: 6 × 7 = 42

Answer: 42 m²

1 m²

As Reza found, 42 m² = 420000 cm²
Because 1 m² = 10000 cm² (100 cm × 100 cm)

This is the part of the map of the area near the parliament building in Dhaka. One side of the square is 1 km.
How do you express the area?



1 km (1000 m)

1 km² (1000000 m²)

1 km (1000 m)

$1\ km^2$

The unit used for large areas of land like towns and districts is the area of a square with **1 km** sides.
It is **1 square kilometre**, and written as **$1km^2$**

3 The football field is rectangular in shape, and length of the longer side is 100 m and the width is 70 m. Find the area of the field.

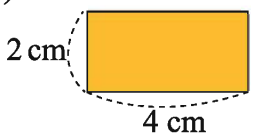
4 Find the area of the rectangular piece of land that runs 2 km east-west and 3 km north-south.

5 Find the area of the square piece of land with 10 km sides.

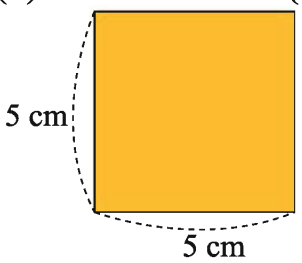
10.6 Exercise (2)

1. Find the area.

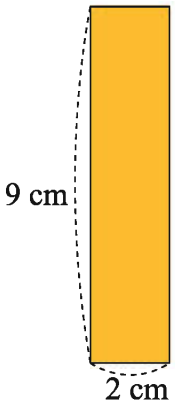
(1)



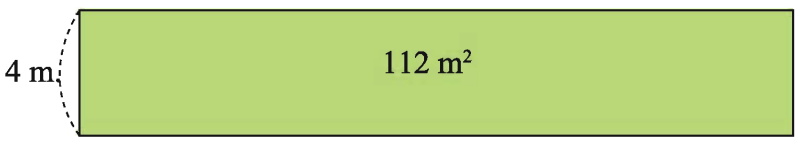
(2)



(3)



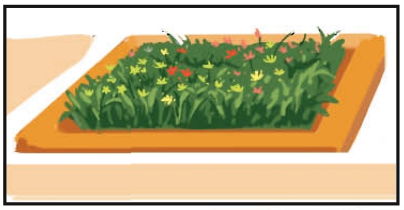
2. What is the length of the rectangular flowerbed below?



3. Find the area.
   (1) A blackboard with 80 cm long and 5 m wide.
   (2) The surface of the rectangular table with a width of 150 cm and a width of 2 m.
   (3) A rectangular piece of land that runs 2 km east-west and 500 m north-south.

4. Connect the dots.

(A) Area of a surface of the desk	•	• 200 km^2
(B) Area of a flowerbed	•	• 2250 cm^2
(C) Area of a town	•	• 320 m^2



Chapter Eleven

Time

11.1 Time

Let's convert the unit of time, add and subtract the time.

Let's review relation among the unit of time.

year	month	week	day	hour	minute	second
1 year ↔ 12 months						
	1 month ↔ 4 weeks (or, 4 weeks and 2 or 3 days)					
		1 week ↔ 7 days				
			1day ↔ 24 hours			
				1 hour ↔ 60 minutes		
					1 minute ↔ 60 seconds	

Let's convert 1 hour, 1 day, and 1 week, into seconds.

1 minute is 60 seconds, so…

(1) 1 hour = 60 minute = 60 × 60 second = 3600 second

(2) 1 day = 24 hour = 24 × 3600 second = 86400 second

(3) 1 week = 7 day = 7 × 86400 second = 604800 second

Convert day, and week, into minutes.

1 hour is 60 minutes, so…

(1) 1 day = 24 hour = ☐ minutes

(2) 1 week = ☐ = ☐ = ☐ minutes

2 Express following period in hour.

(1) 3 day (2) 1 week

(3) 9 weeks and 6 days

(1) 3 days = 3 × 24 hours = 72 hours 72 hours

(2) 1 week = 7 days = 7 × 24 hours = 168 hours 168 hours

(3) 9 weeks and 6 days = 9 × 7 days + 6 days
= 63 days + 6 days
= 69 days
= 69 × 24 hours
= 1656 hours 1656 hours

3 Sajjad and Shohag are two brothers. Age of Sajjad is 14 years 5 month and the age of Shohag is 9 years 9 months. What is the difference of their ages?

As we find difference, the operation should be [ ].

Why don't we subtract in every unit, smaller unit first and subtract in order like calculation of integers?

	year	month
	14 13	5 +12
−	9	9
		8

	year	month
	14 13	5
−	9	9
	4	8

[month]
5 − 9, but we cannot do it, so move 1 year (= 12 months) and subtract 9 from 17.
17 − 9 = 8

[year] 13 − 9 = 4

The difference is: **4 years 8 months**

4 As of September, 2014, world record of men's marathon and women's marathon are as follows.

men's marathon	2:02:57 (2 hours 2 minutes 57 seconds)
women's marathon	2:15:25 (2 hours 15 minutes 25 seconds)

(1) What's the difference between these two?

We can subtract in every unit, smaller unit first and subtract in order.

	hour	minute	second
	2	15 ~~14~~	25 (+60)
−	2	2	57
		12	28

[second]
25 − 57, but we cannot do it, so move 1 minute (= 60 seconds) and subtract 57 from 85.
85 − 57 = 28

[minute] 14 − 2 = 12

[hour] 2 − 2 = 0

The difference is: **12 minutes 28 seconds**

(2) How do we calculate if we need to add these two times?

	hour	minute	second
	2	2 (+1)	57
+	2	15	25
	4	18	22

[second]
57 + 25 = 82,
and 82 = 60 + 22 . so carry 1 minute.

[minute] 2 + 15 (+1) = 18

[hour] 2 + 2 = 4

The total is: **4 hour 18 minutes 22 seconds**

11.2 Exercise

1. Express in seconds.

2 minutes = 120 seconds	10 minutes = seconds
4 minutes = seconds	5 minutes = seconds
12 minutes = seconds	20 minutes = seconds

2. Express in days

48 hours = 2 days	2 weeks = days
72 hours = days	3 weeks = days
120 hours = days	4 weeks = days

3. Add together and change them to hours and minutes.

	minute	hour and minute
50 minutes + 30 minutes	80 minutes	1 hour and 20 minutes
35 minutes + 35 minutes		
60 minutes + 80 minutes		
90 minutes + 45 minutes		
120 minutes + 60 minutes		

4. Salma is 10 years 9 month old and the age of Mita is 12 years 0 months. What is the difference of their ages?

5. Masuda Begum is entitled to get leave for 3 months 3 weeks 12 days. She took leave for 2 months 4 weeks 3 days. How many days' leave can she take more? (1 month = 30 days)

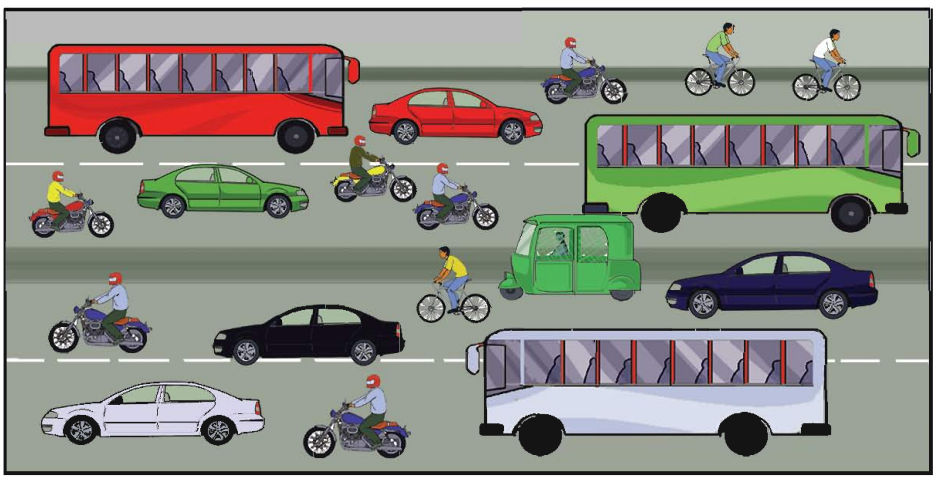
Chapter Twelve

Collection and Arrangement of Data

12.1 Making tables

Let's try to arrange the data on the table.

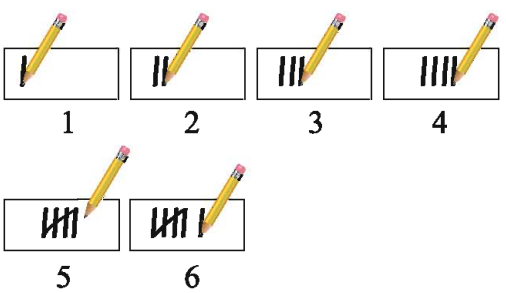
Let'sthink about how to count the number of the vehicles passing in front of us.



We need to make a record. Otherwise we forget the number.

Then let's use **tally marks.**

Tally marks are a quick way to keep track of numbers in groups of five. One vertical line is made for each of the first four numbers, but the fifth line is drawn across the previous four. Then continue making single marks again. This is very easy to count using **Tally marks**.



We would like to express the number of the veicles on the table with tally marks. Let's complete the table on the right.

Name of vehicles	Tally marks
Bicycle	III
Standard vehicle	
Mortor cycle	
Bus	
CNG	

Now let's convert tally marks into numeral characters to remake the table. And add the total number.

(1) Which one of the vehicles is most used?

(2) Which one of the vehicles is least used?

Name of vehicles	Number
Bicycle	3
Standard vehicle	
Mortor cycle	
Bus	
CNG	
Total	

The teacher calls out the names of the fruits at random. Listen carefully and keep track of numbers with tally marks. And after that convert tally marks into numeral characters to complete the table below.

Name of fruits	Tally marks	Number
Orange		
Banana		
Apple		
Guava		
Total		

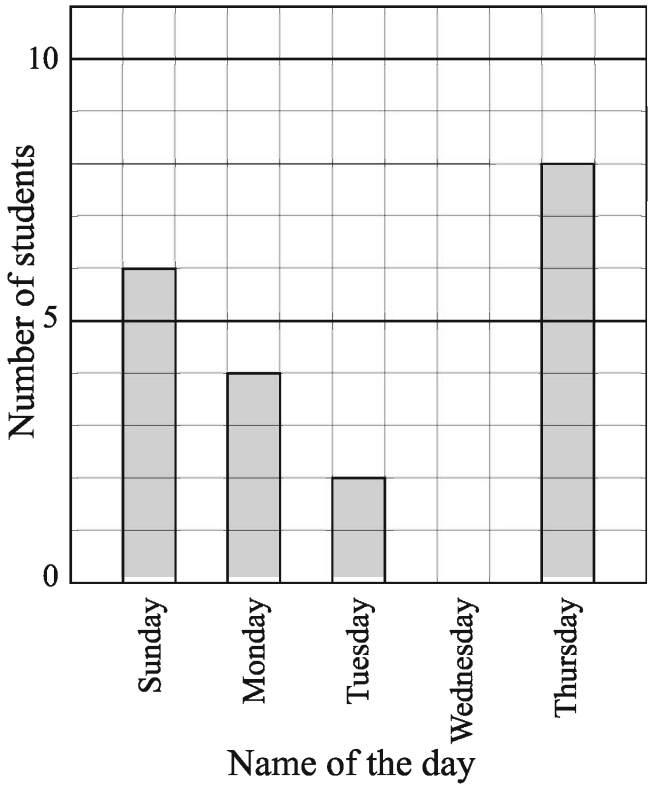
12.2 Display with a Bar Diagram

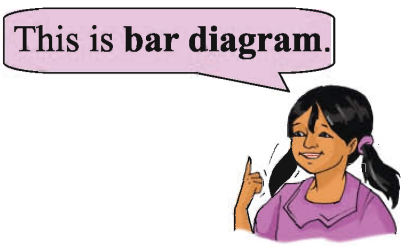
Let's try to display the data on a bar diagram.

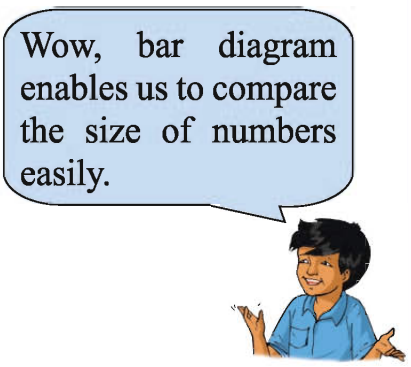
The number of absentees of class A in different days of the week is given in the table on the right and on the **bar diagram** below. Let's find how to read them.

Day	Number of absent students
Sunday	6
Monday	4
Tuesday	2
Wednesday	0
Thursday	8
Total	20

The number of absentees of class A





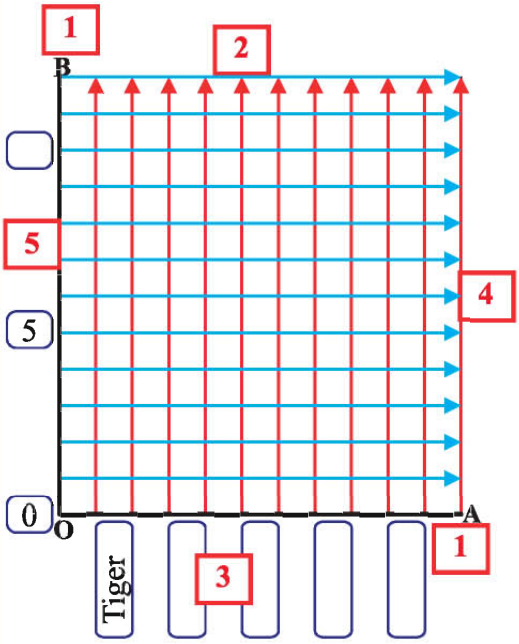


(1) What is the title of the bar diagram?
(2) How many students does one mark on the vertical scale represent?
(3) On which day were most of the students absent?
(4) On which day were all students present?

2 The table on the right shows the animals that the students in Mita's class like. Draw the bar diagram.

Animals	Number of students
Tiger	9
Elephant	11
Hippopotamus	4
Lion	7
Leopard	3
Total	34

How to draw a bar diagram



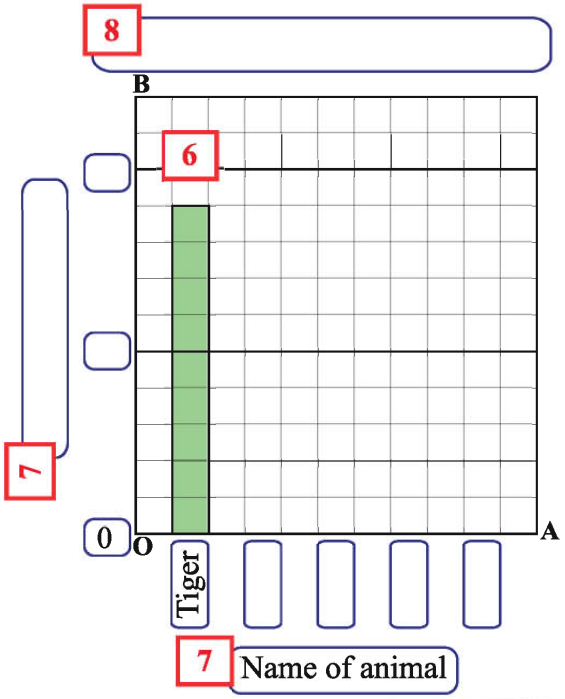
Step 1: Draw a horizontal line **OA** and a vertical line **OB**.

Step 2: Draw some vertical lines on **OA** keeping equal spaces between them. The number of lines should be more than the number of animals.

Step 3: Write the name of the animals under between two vertical lines following the figure.

Step 4: Draw some horizontal lines on **OB** keeping equal spaces between them. The number of lines should be more than the number of students.

Step 5: Scale for the number of student on **OB** (like 0, 5 and 10 students)



Step 6: Draw bars on **OA** for each animal according to the number of students' liking.

Step 7: Write title of horizontal axis as "name of animal" and vertical axis as "number of student"

Step 8: Now write the title of the bar diagram as "Favorite animal of the student"

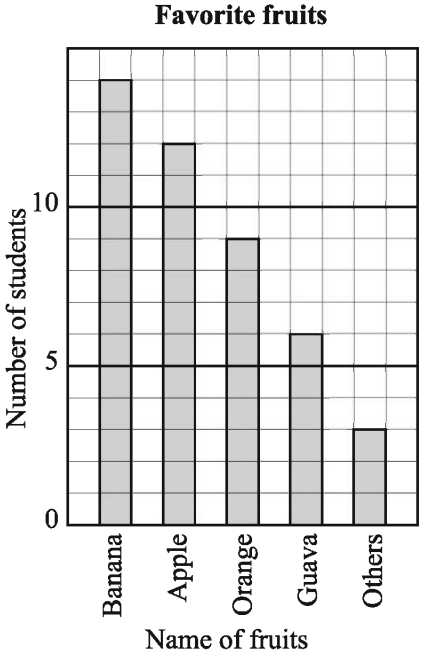
12.3 Exercise

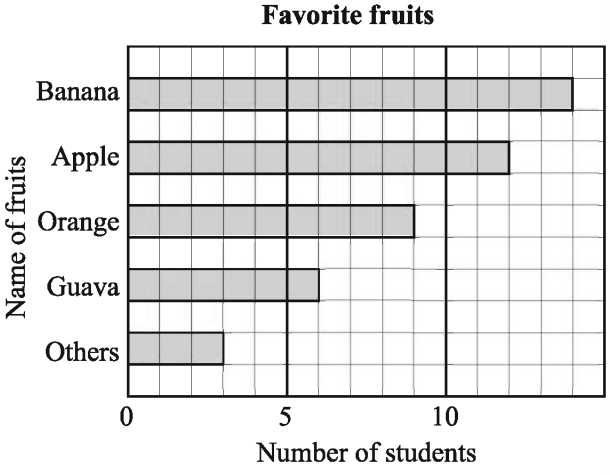
1. This is the memo of the sales of various vegetables in a shop. Write the total with a numeral characters.

Vegetables	Tally marks	Total
Lemon	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 III	
Cabbage	𝍸 𝍸 𝍸 𝍸 𝍸 II	
Cauliflower	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸	
pumpkin	𝍸 𝍸 IIII	
Total		

2. Draw the bar diagram of which title is "number of the vehicles" using the data in P.139.

3. Compare these two diagrams. Can we say both of two are bar diagram? Talk freely with your friends and give your opinion.





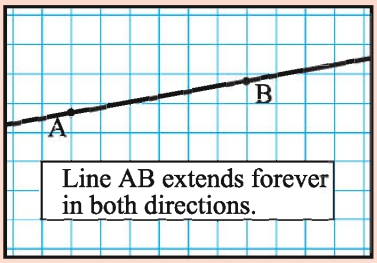
Chapter Thirteen

Lines and Angles

13.1 Lines

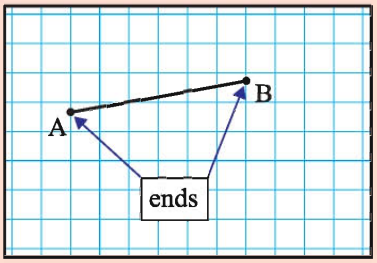
Let's learn about the lines and the relation of them.

A **straight line** is:
- Straight (no curves)
- Endless (extends in both directions without end)
- has no thickness



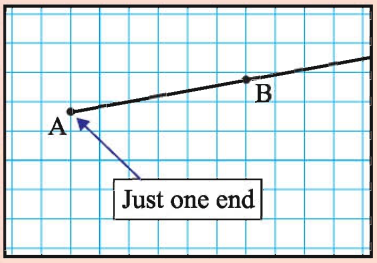
To show the endlessness we can draw a **straight line** like this: ⟷

If it does have ends, it is:
A **line segment**.



If it has just one end, it is:
A **Ray**.

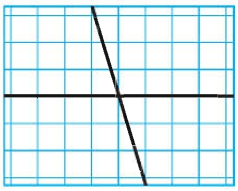
Just like a…ray.



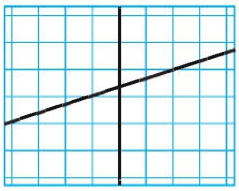
To show the endlessness of one side, we can draw a **ray** like this: •⟶

Let's learn about how lines meet or intersect each other.

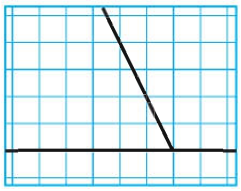
a



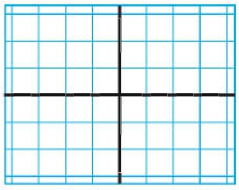
b



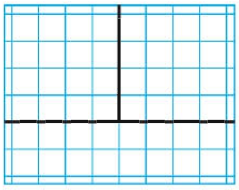
c



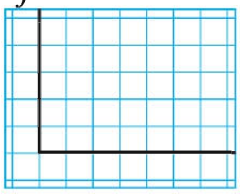
d



e

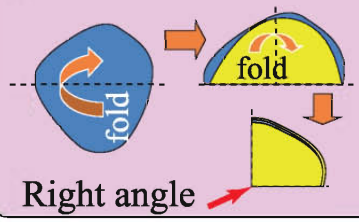


f

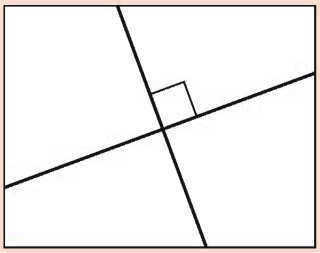


In the diagram *d*, *e* and *f*, lines meet or intersect at a **right angle**.

We learned right angle in Grade 3.



A line is **perpendicular** to another if it meets or intersects it at right angle.

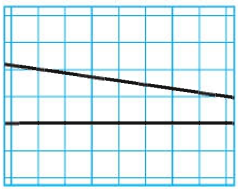


The lines in the diagram d, e, and f, are **perpendicular** lines.

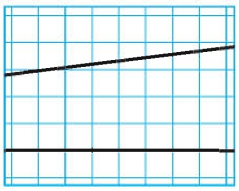
1 Look for perpendicular lines around you.

Are there any lines which don't meet or intersect each other?

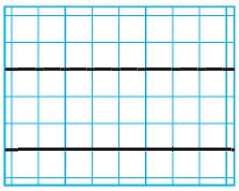
a



b

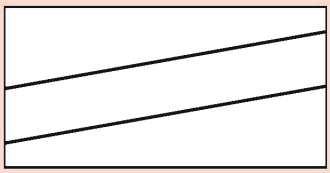


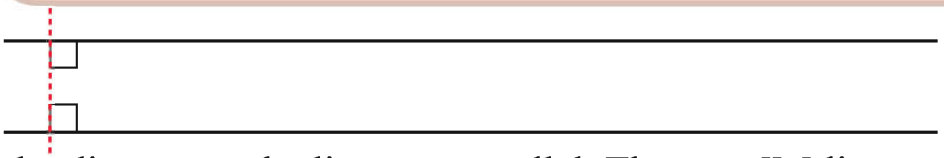
c



In the diagram *a* and *b*, two lines get closer each other and they will intersect.

Lines are **parallel** if they are always the same distance apart, and will never meet.

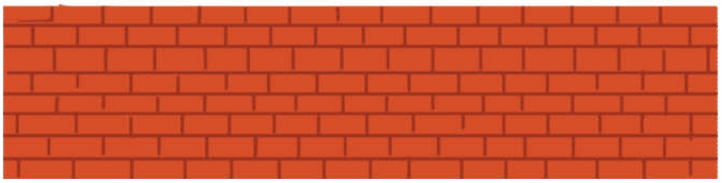


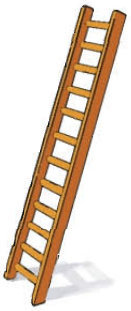


In the diagram *c*, the lines are parallel. The **parallel** lines are both perpendicular to the same line, and no matter how far you extend them, they will never intersect.

We can imagine two straight rail lines as the model of parallel lines.

Look for parallel lines around you.



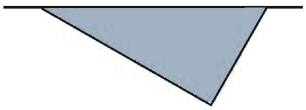


Let's draw **perpendicular** and **parallel lines** with set squares.

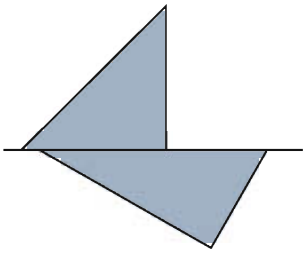
Perpendicular lines

1

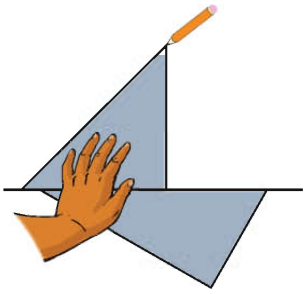
2



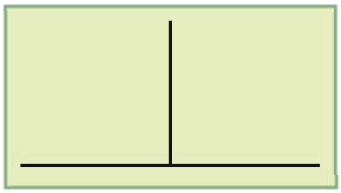
3



4



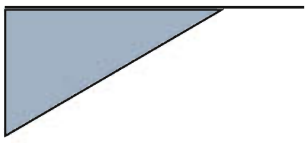
5



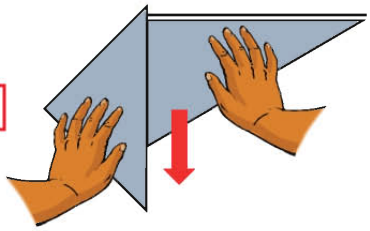
Parallel lines

1

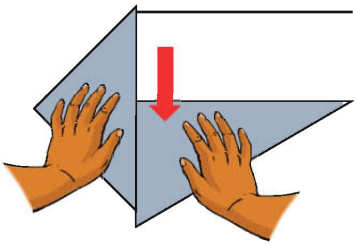
2



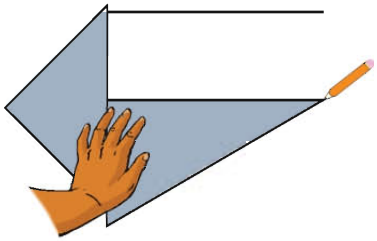
3



4



5

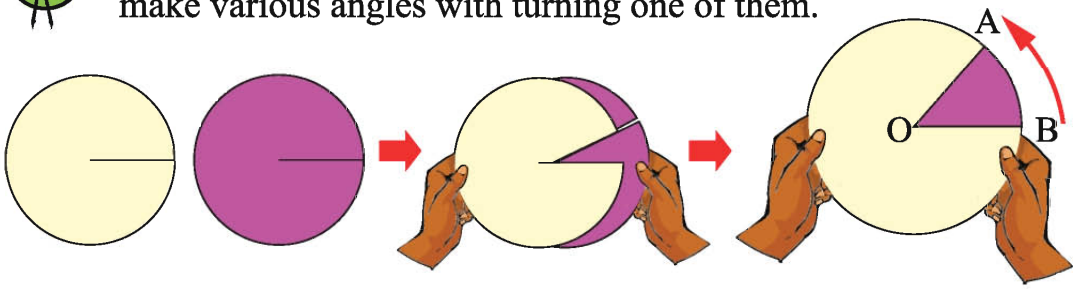


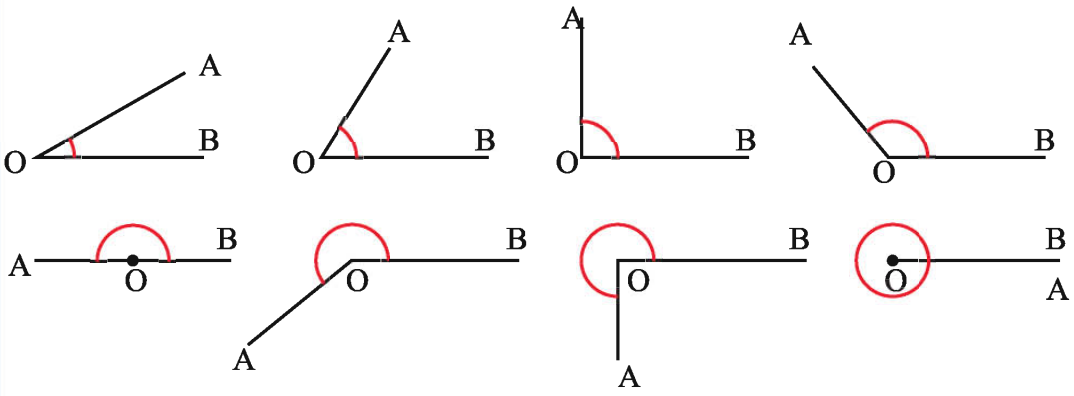
6

13.2 Angle

Let's find the size of the angles and draw them.

Let's put two circles made of thick paper like following and make various angles with turning one of them.



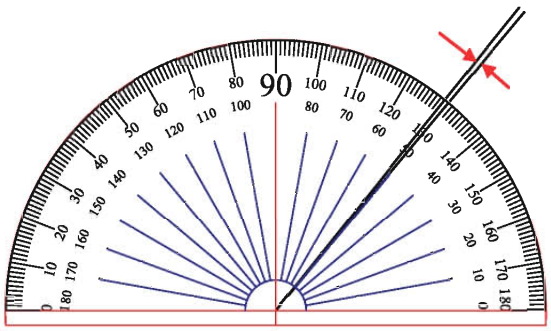


The size of the angle is not related to how long the length of sides making the angle are, but to how open they are.

It would be convenient if we could express the size of angles using numbers like length, area, volume and weight.

The unit for the size of angles is **degree**, and is used " ° " to show it.

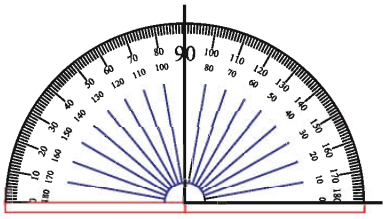
We use a **protractor** to measure the size of angles.



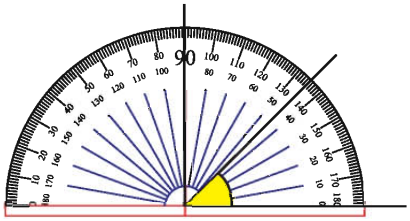
1° (1 degree)

1° × 90 = right angle.
Right angle = 90°

Let's see some typical angle by dividing 90°.

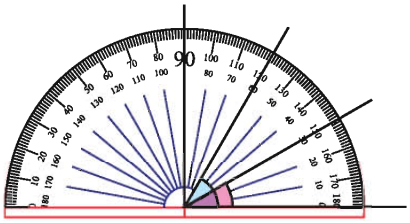


90° (Right angle)



$\frac{1}{2}$ of 90°

45°



$\frac{2}{3}$ of 90°

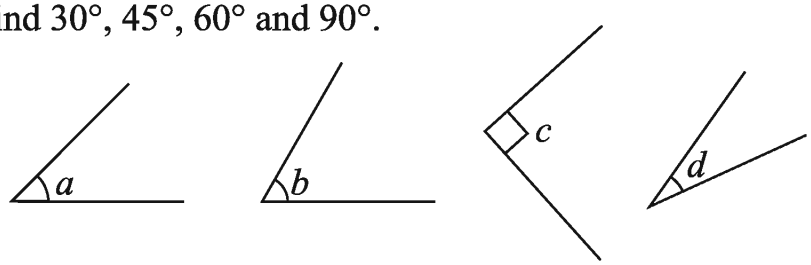
60°

$\frac{1}{3}$ of 90°

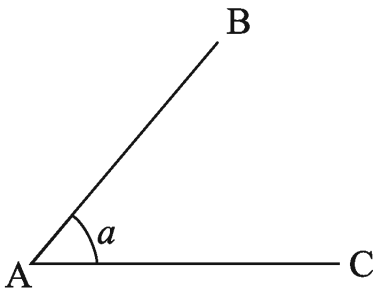
30°

(These angles are 90°, 45°, 60° and 30°)

1 Find 30°, 45°, 60° and 90°.



2 Now use a protractor to find the size of the angle a .

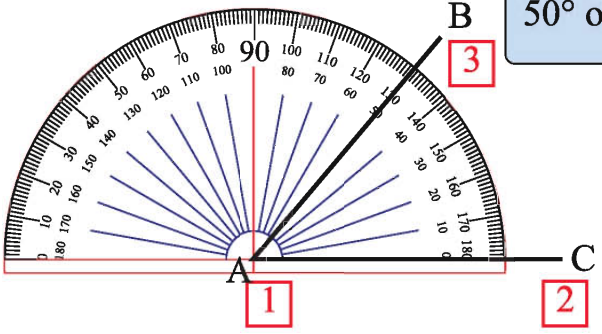


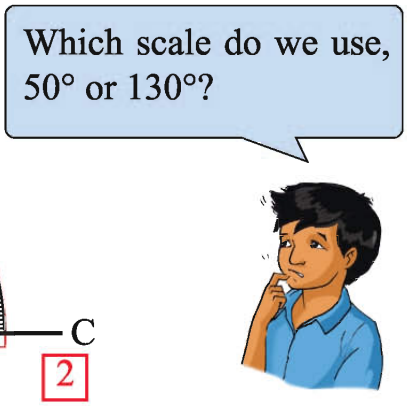
Angle *a* can be written as ∠*a*, or ∠CAB (read as angle CAB).

1 Place the central point of the protractor at vertex A.

2 Match side AB to the 0° sign of the protractor.

3 Read the scale mark that overlaps side AC

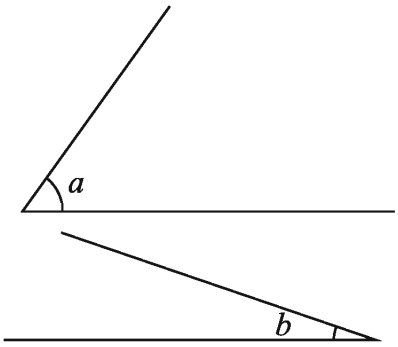




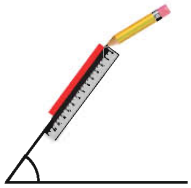
The size of angle of *a* is 50°. (∠*a*=50°or ∠CAB =50°)

2 Measure the size of the angles.

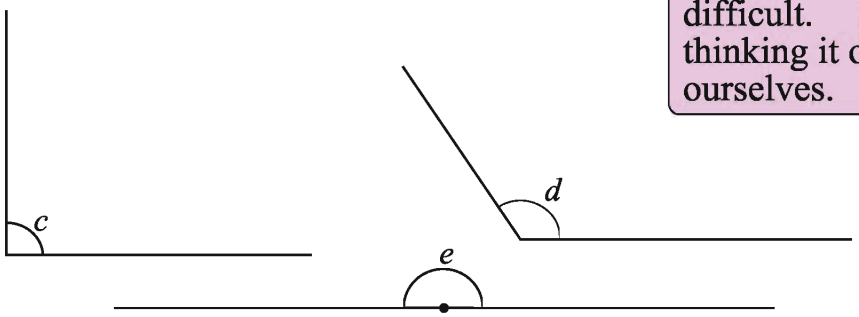
How do we measure b?



If the side of an angle is short to measure, you can extend it.



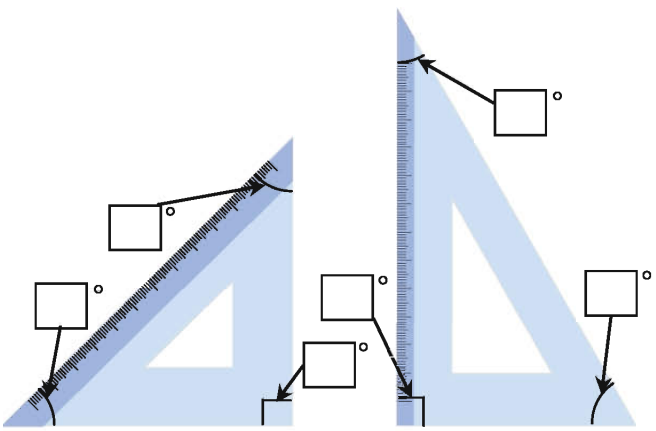
I don't think it's so difficult. Let's try thinking it out for ourselves.



We can read degrees of the protractor from left to right as well.

∠e is 180°. It is called **straight angle** *e*.

3 Measure the size of the angles on a set square.

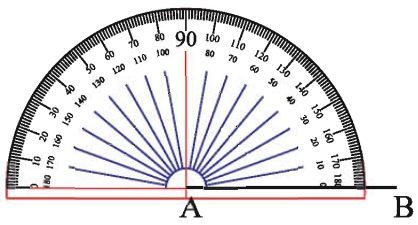


4 Draw an angle with a size of 50°.

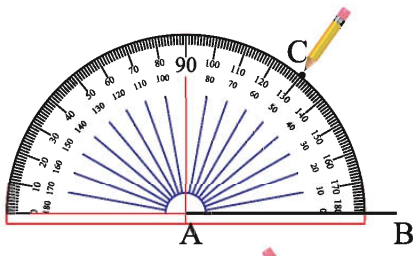
Can we also use a protractor to draw angles?

1. Draw a straight line AB.

2. Place the central point of the protractor at the point A, and match line AB to the 0° line.

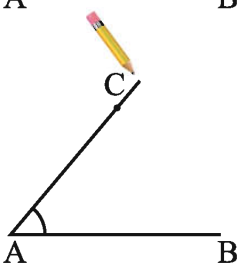


3. Draw a point C at the 50° scale mark.



4. Take the protractor away and draw a line with a ruler from the point A to the point C.

5. ∠CAB is 50°

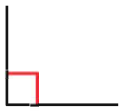


3 Draw angles of following sizes with a protractor.

ⓐ 30° ⓑ 75° ⓒ 90° ⓓ 135° ⓔ 180°

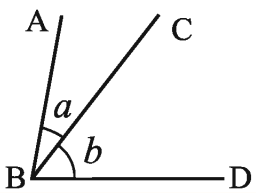
Now we can measure and draw angles.
Let's learn much about angles.

The angles can be classified like below:

angle	size	name
	smaller than 90°	**acute angle**
	90°	**right angle**
	larger than 90° and smaller than 180°	**obtuse angle**
	180°	**straight angle**

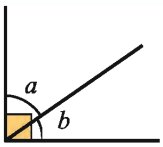
The relation of angles can be expressed like below.

When two angles have a common side and a common vertex, and don't overlap, they are **adjacent angles**.



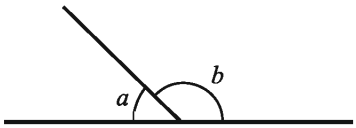
$\angle a$ and $\angle b$ are **adjacent angles**.
Because: They have the common side, CB
They have the common vertex, B

When two angles add up to 90° (a right angle), they are **complementary angles**.



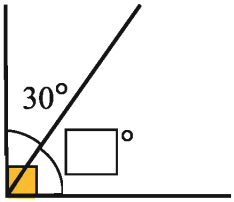
$\angle a$ and $\angle b$ are **complementary angles**.
Because: They add up to 90°

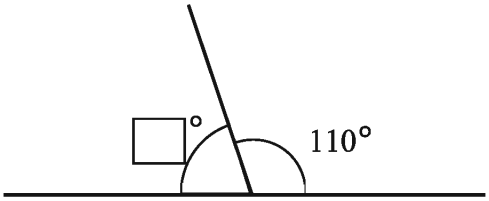
When two angles add up to 180° (a straight angle), they are called **supplementary angles**.



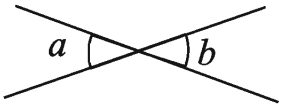
$\angle a$ and $\angle b$ are **supplementary angles**.
Because: They add up to 180°

4 Find hidden angles.





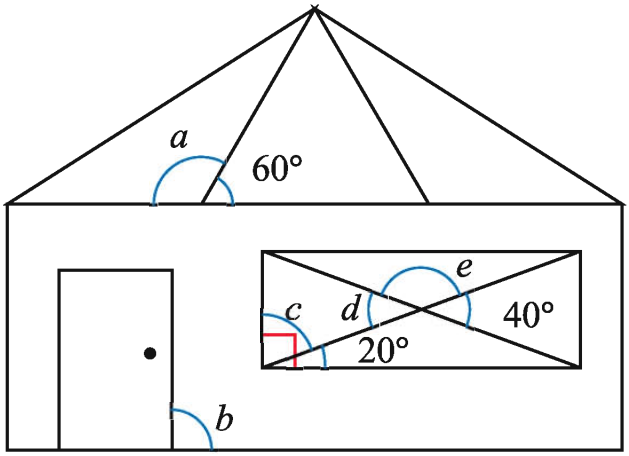
Vertically opposite angles are the angles opposite each other when two lines cross.



$\angle a$ and $\angle b$ are **vertically opposite angles.** The interesting thing is that vertically opposite angles are mutually equal.

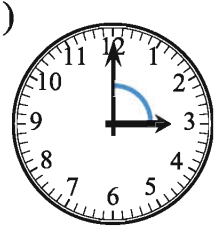
$$\angle a = \angle b$$

5 Find $\angle a$, $\angle b$, $\angle c$, $\angle d$ and $\angle e$ without measuring the angles.

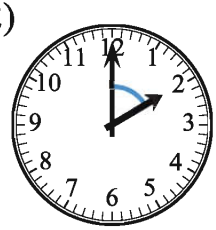


6 Say the angle formed by the long hand and the short hand of the clock.

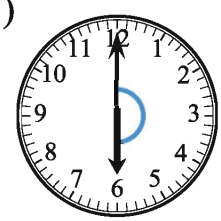
(1)



(2)



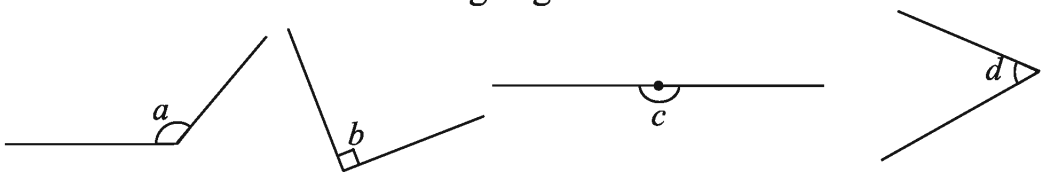
(3)



(4)

13.3 Exercise

1. Answer the names of following angles.

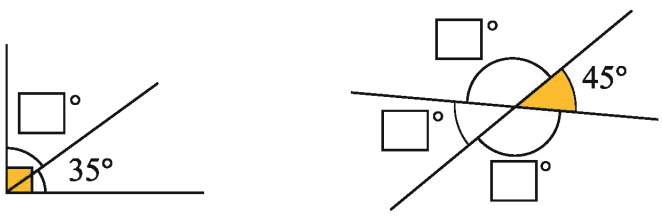


2.Measure the following angles with a protractor.

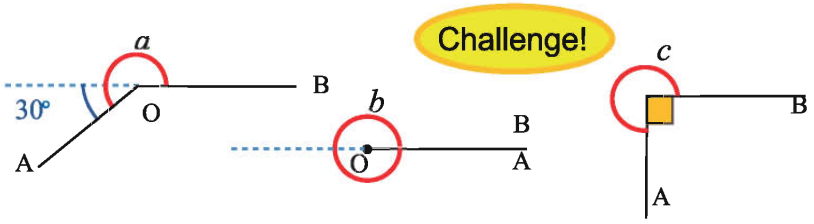
3. Draw following angles with a protractor.

(a) 25° (b) 175° (c) 90° (d) 180°

4. Find the angles.



5. Find the size of the following angles.



6. Explain what are **parallel** and **perpendicular** in words.

Chapter Fourteen

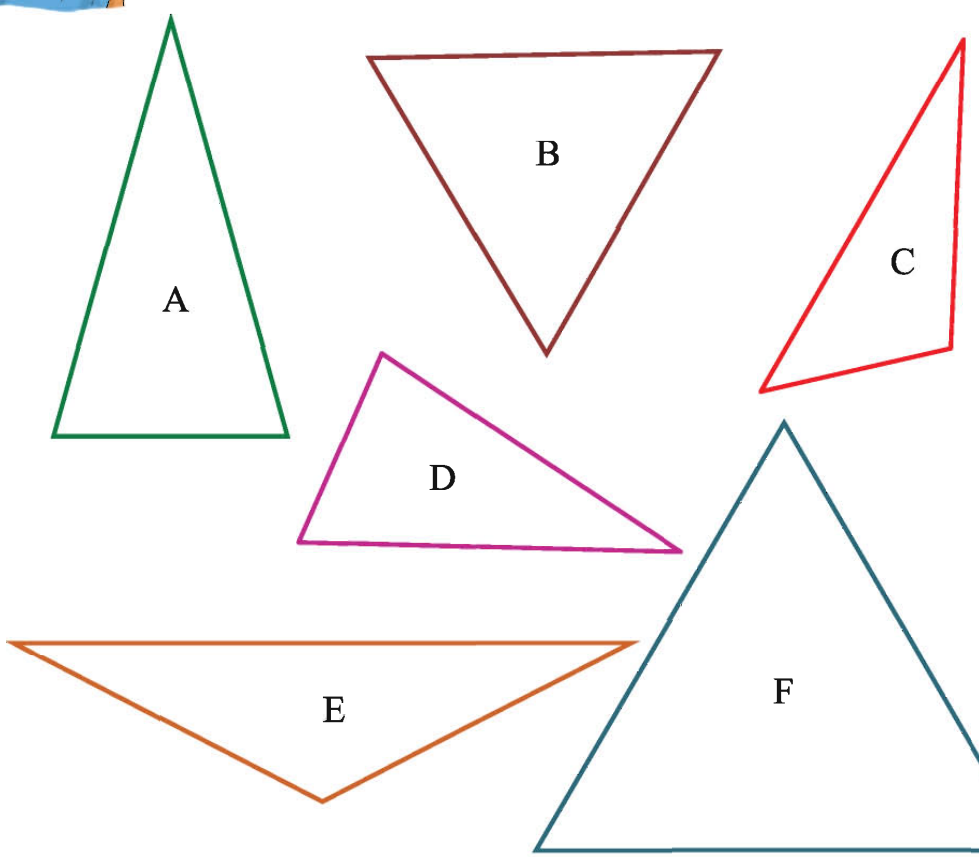
Triangle

14.1 Triangles

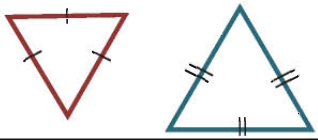
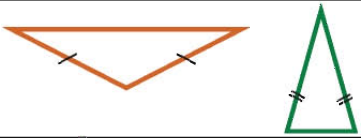
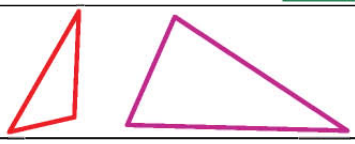
Let's study caracteristics of triangles.

Let's sort the triangles according to the length of their sides.

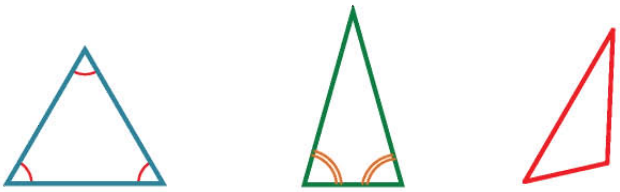
By measuring the length of the sides with a ruler, find the characteristics of the triangles.



There are three specific names given to triangles that tell how many sides are equal.

Tree equal sides 	**Equilateral Triangle**
Two equal sides 	**Isosceles Triangle**
No equal sides 	**Scalene Triangle**

Using a protractor, let's measure the size of each angle of the triangles in the previous page.



Equilateral Triangle has three equal angles, and they are always **60°**.
Isosceles Triangle has two equal angles.
Scalene Triangle has no equalangles.

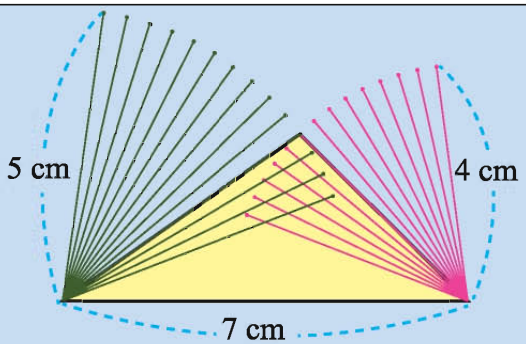
Not only the length of the side but also the angles characterize triangles.

OK. Now let's try to draw triangles.

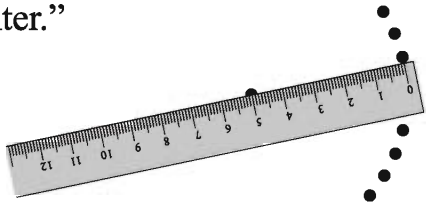
Draw a scalene triangle with side of 7cm, 5cm and 4cm.

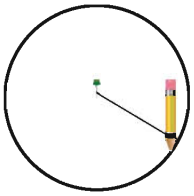
Let's begin with drawing 7cm side.

OK. But how can we draw the second and third sides? Is there any good way to find the meeting point of these sides?



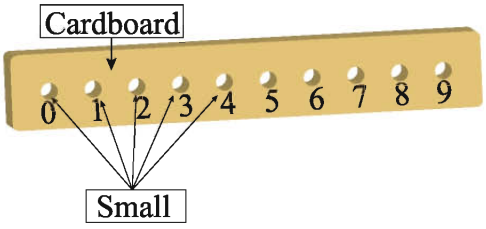
In the diagram above, the trace of the points of the sides are the same as a part of circles; in other words, "points which are the same distance from the center."

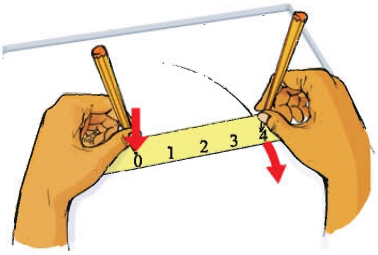




I remember we studied it in Grade 3.

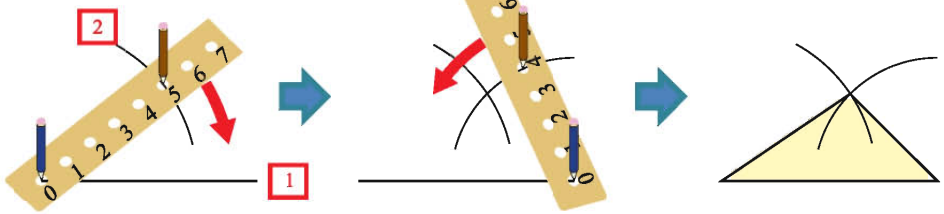
In order to draw a part of a circle, we can make a scaled rectangular piece of cardboard with small holes like below, instead of using a board pin and thread like the illustration above.





Now, let's draw the triangle.

1 Draw one side. (the base of the triangle:7cm)



2 Draw **5 cm** distance from the left side of the base.

3 Draw **4 cm** distance from the right side of the base.

4 Draw two sides using the point you've found.

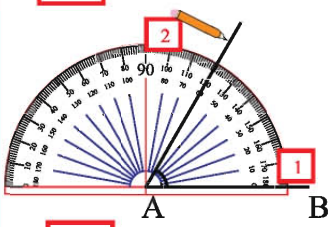
1 Draw the following triangles with the method above.

1. An equilateral triangle with sides of 6cm.
2. An isosceles triangle with sides of 5cm, 7cm and 7cm.

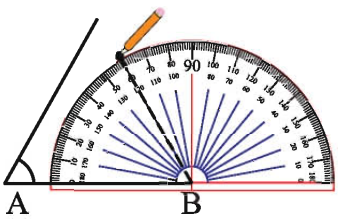
Equilateral Triangle has three **60°**, and **Isosceles** Trianglehas two equal angles. Can we draw a triangle using these angles?

4 Draw an equilateral triangle with sides of 5cm.

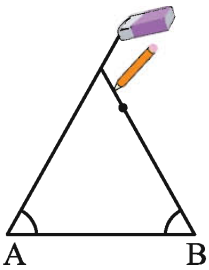
1 Draw one side. (line AB:5cm)



2 Draw an angle with a size of 60° with the method in page 151.



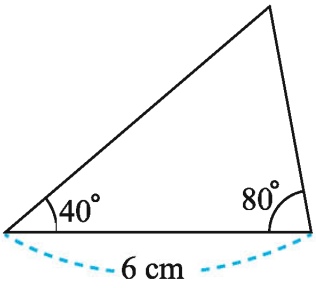
3 Find 60° from B.



4 Draw a line and adjust the length of the sides.

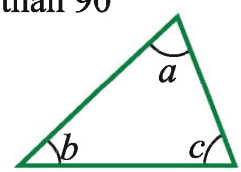
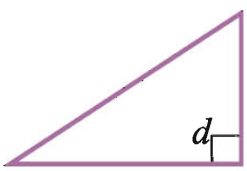
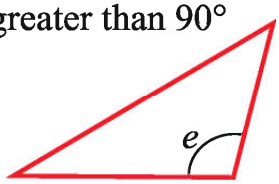
After drawing the equilateral triangle with sides of 5cm using the angles, make sure that length of all the sides are the same and all the angles are 60°.

2 Draw the triangles as on the right.

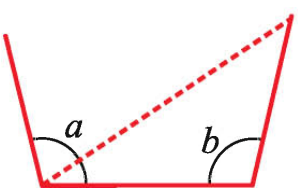


Other names of triangles

Triangles can also be named based on there angles.

All three angles are less than 90° (a, b and $c < 90°$) 	**Acute Triangle**
One of the angles is 90° ($d = 90°$) 	**Right Angled Triangle**
One of the angles is greater than 90° ($e > 90°$) 	**Obtuse Triangle**

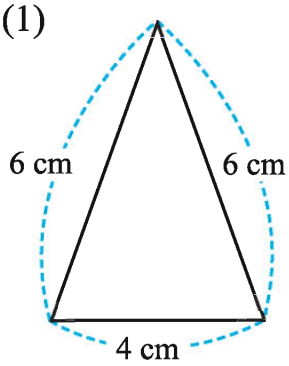
3 Are we able to darw an **Obtuse Triangle** which has two obtuse angles? And explain the reason why?



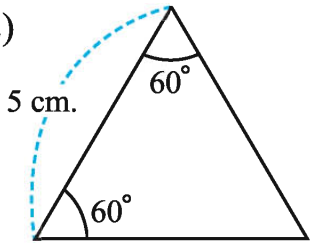
14.2 Exercise

1. Draw following triangles.

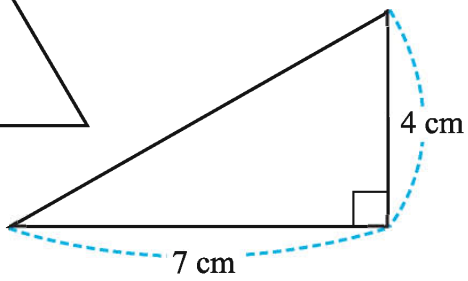
(1)



(2)



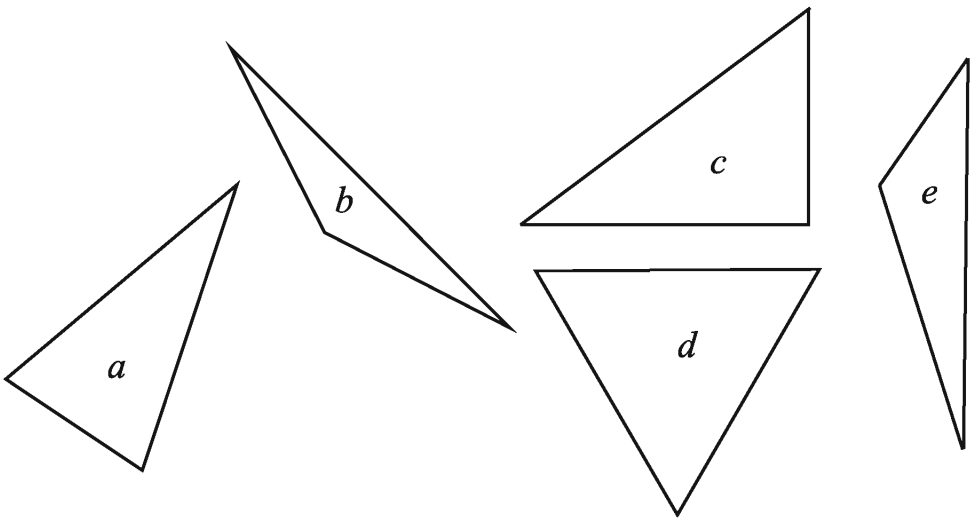
(3)



2. Answer the two kinds of names of the triangles above.

Classification	Triangle (1)	Triangle(2)	Triangle(3)
Based on the **sides**			
Based on the **angles**			

3. Group these triangles. And talk about grouping in the classroom.



Answers

Chapter 1:

Exercise-(1) Page-10

1. Do yourself **2.** (1) 45,000; Forty five thousand (2) 1,00,00,000; One crore (3) 10,00,000; Ten lac (4) 1,27,000; One lac twenty five thousand (5) 10,11,010; Ten lac eleven thousand and ten **3.** Do yourself **4.** (1) 1,35,24,689 (2) 97,57,834 (3) 5,55,55,555 **5.** (1) A. 1500 B. 3000 C. 4900 (2) A. 90,000 B. 93,000 C. 1,00,000 D. 1,07,000

Exercise-(2) Page-18

1. (1) < (2) > (3) < (4) < (5) = (6) > **2.** (1) 9,86,420 (2) 2,04,689 (3) 8,64,209 (4) 2,04,689 **3.** 371993-886397-2456891-3704231-4589476, highest population: D, lowest population: A.

Chapter 2:

Exercise- Page-32

1. (1) 68,889 (2) 80,194 (3) 73,921 (4) 90,000 (5) 69,989 (6) 80,420 (7) 83,094 (8) 96,006 (9) 3,810 (10) 34,518 (11) 60,909 (12) 1,607 (13) 80,306 (14) 5,894 (15) 22,222 (16) 99,991 **2.** (1) 55,101 (2) 1,240 **3.** (1) 10,000 (2) 2,426 (3) 28,500 **4.** 32,955 sacks **5.** 2,043 **6.** 4,572 **7.** 8,126 **8.** 33,710 **9.** Gita: 420 taka, Shihab 810 taka **10.** 3,995 boys **11.** 17,700 taka **12.** 2,029 years old.

Chapter 3:

Exercise- Page-42

1. (1) 7,520 (2) 1,000 (3) 45,300 (4) 10,000 (5) 3,770 (6) 63,272 (7) 35,280 (8) 64,960 (9) 31,668 (10) 6,240 (11) 31,784 (12) 98,472 (13) 65,626 (14) 98,331 (15) 88,803 (16) 62,321 (17) 43,010 (18) 86,328 (19) 83,804 (20) 87,969 **2.** (1) 15,616 (2) 19,278 (3) 18,240 (4) 49,500 (5) 1,57,800 (6) 2,46,000 **3.** (1) 91,200 (2) 91,200 (3) 9,12,000 **4.** (A) wrong-143 × 6; right- 143 × 60; right answer 8866 (B) 0 of multiplicand is not multiplied; right answer 74783 **5.** Do yourself. **6.** 10,000 taka. **7.** 18,500 tickets **8.** 3,125 taka **9.** 3,450 m **10.** 1,980 taka **11.** 50,875 taka **12.** 74,490 pieces.

Chapter 4

Exercise- Page-56

1. (1) 2 (2) 2 remainder 10 (3) 8 (4) 7 remainder 30 (5) 3 (6) 2

(7) 2 remainder 1 (8) 3 remainder 15 (9) 4 (10) 6 remainder 17 (11) 8 (12) 5 remainder 6 (13) 31 (14) 43 remainder 3 (15) 21 remainder 25 (16) 30 remainder 14 (17) 215 (18) 216 remainder 6 (19) 93 (20) 291 remainder 4 **2.** (1) 38 (2) 8 (3) 100 (4) 14 **3.** Do yourself. **4.** 112 **5.** 9 groups **6.** 7 postcards **7.** 41 boxes, 8 pencils **8.** 22 m **9.** 27 taka **10.** 28 garland

Chapter 5
Exercise- Page-65

1. (1) 53 (2) 35 (3) 25 (4) 7 **2.**(1) 824 (2) 524 (3) 66,000 (4) 9,200 (5) 800 (6) 776 **3.** (1) 108 taka (2) 146 (3) 3,000 taka **4.** Moni 500 taka, Rupa 375 taka **5.** father 44 years old, son 11 years old. **6.** 96 taka **7.** Do yourself.

Chapter 6
Exercise- Page-72

1. (1) > (2) = (3) = **2.**(1) true (2) true (3) false (4) false **3.** (1) −, × (2) +, − (3) ×, ÷ (4) −, × **4.** (1) 25 (2) 8 (3) 9 (4) 4
5. (1) $\square \div 7 = 5$ remainder 4, $\square = 39$ (2) $7 \times (\square + 3) = 56$, $\square = 5$

Chapter 7:
Exercise- Page-85

1. (1) 4, 8, 12 (2) 7, 14, 21 (3) 11, 22, 33 (4) 14, 28, 42 **2.** (1) 12, 24, 36; LCM 12 (2) 36, 72, 108; LCM 36 (3) 9, 18, 27; LCM 9 (4) 40, 80, 120; LCM 40 **3.** (1) 1, 3, 9 (2) 1, 2, 3, 4, 6, 12 (3) 1, 2, 3, 4, 6, 8, 12, 24 (4) 1, 2, 3, 5, 6, 10, 15, 30 **4.** (1) 1, 3 HCF:3 (2) 1, 7 HCF:7 (3) 1, 2, 4, 8, (4) 1 HCF:1 **5.** (1) LCM 24, HCF 4 (2) LCM 36, HCF 3 **6.** Do yourself **7.** (1) 248, 460, 912, 810 (2) 339, 912, 555, 810, 951 (3) 515, 460, 555, 810, 725 **8.** 12:24 p.m. **9.** 12 cm **10.** 35 cm **11.** 9 children; 5 apples, 2 oranges.

Chapter 8:
Exercise- (1) Page-94

1. (1) $\frac{2}{3}, \frac{5}{8}, \frac{3}{9}, \frac{42}{48}, \frac{2}{25}$ (2) $\frac{4}{4}, \frac{1}{1}, \frac{76}{76}, \frac{3}{3}$

2. (1) $\frac{2}{7} < \frac{3}{7} < \frac{6}{7} < \frac{7}{7}$ (2) $\frac{4}{11} < \frac{4}{9} < \frac{4}{7} < \frac{4}{5}$ (3) $\frac{11}{91} < \frac{11}{23} < \frac{11}{17} < \frac{11}{13}$

3. (1) 2 (2) 12 (3) 27 (4) 15 (5) 72 (6) 48 (7) 1 (8) 3 (9) 7 (10) 2 (11) 13 (12) 9

4. (1) $\frac{1}{2}$ (2) $\frac{1}{7}$ (3) $\frac{1}{4}$ (4) $\frac{1}{3}$ (5) $\frac{2}{3}$ (6) $\frac{3}{4}$ (7) $\frac{4}{5}$ (8) $\frac{8}{9}$ (9) $\frac{3}{5}$ (10) $\frac{4}{7}$ (11) $\frac{4}{7}$ (12) $\frac{3}{5}$

Exercise- (2) Page-101

1. (1) > (2) < (3) > (4) = (5) > **2.** (1) $\frac{3}{4}$ (2) $\frac{29}{35}$ (3) $\frac{13}{24}$ (4) $\frac{16}{21}$ (5) $\frac{23}{36}$ (6) $\frac{14}{15}$ (7) $\frac{4}{5}$ (8) $\frac{3}{10}$ (9) $\frac{2}{3}$ (10) $\frac{3}{4}$ **3.** (1) $\frac{1}{12}$ (2) $\frac{13}{30}$ (3) $\frac{1}{6}$ (4) $\frac{5}{18}$ (5) $\frac{5}{36}$ (6) $\frac{1}{2}$ (7) $\frac{1}{3}$ (8) $\frac{1}{10}$ (9) $\frac{1}{5}$ (10) $\frac{1}{15}$ **4.** (1) $\frac{2}{3}$ (2) $\frac{13}{18}$ (3) $\frac{1}{18}$ (4) $\frac{13}{20}$ **5.** (1) 2 (2) 1 (3) 2 **6.** (1) $\frac{19}{24}$ km (2) Sabuj's; $\frac{1}{24}$ km

7. (1) $\frac{19}{20}$ part (2) $\frac{1}{20}$ part.

Chapter 9:

Exercise- (1) Page-110

1. (1) < (2) < (3) > (4) > (5) = (6) > (7) = (8) = **2.** (1) 1 (2) 1.3 (3) 1.3 (4) 2 (5) 0.3 (6) 0.8 (7) 0.9 (8) 1.6 **3.** (1) 4.8 (2) 4.3 (3) 8.6 (4) 9.8 (5) 8 (6) 2.1 (7) 2.2 (8) 6 (9) 0.8 (10) 0.2 **4.** (1) 17.2 km (2) 0.8 km

Exercise- (2) Page-120

1. Do yourself **2.** (1) 31 (2) 296 (3) 1,047 (4) 1,030 **3.** (1) 6, 0.06 (2) 4.9, 0.049 (3) 11.1, 0.111 (4) 73.2, 0.732 **4.** (1) 4.81 (2) 8.08 (3) 7.8 (4) 3.21 (5) 4 (6) 3.19 (7) 7.95 (8) 1.83 (9) 8.58 (10) 1.07 **5.** (1) 0.12 (2) 0.34 (3) 0.75 (4) $\frac{3}{5}$ (5) $\frac{1}{4}$ (6) $\frac{3}{40}$ **6.** 3.68 ℃ **7.** (1) 5.301 (2) 0.135

Chapter 10:

Exercise- (1) Page-126

1. (1) 0.8 cm (2) 4,200 m (3) 5,450 mL, 54.5 dL (4) 307 cm (5) 0.6 kg **2.** 216.2 cm, 2.162 m **3.** 0.605 kg, 605 g **4.** 1,020 mL, 10.2 dL and 1.02 L **5.** 2.35 km and 2035 m.

Exercise- (2) Page-133

1. (1) 8 cm^2 (2) 25 cm^2 (3)18 cm^2 **2.** 28 m. **3.** (1) 40,000 cm^2 (2) 30,000 cm^2 (3) 10,00,000 m^2 (=1km^2) **4.** (A) 2250 cm^2 (B) 320 m^2 (C) 200 km^2

Chapter 11:

Exercise- Pagr-137

1. 4 min. = 240 (seconds) 12 min. = 720 (seconds) 10 min. = 600 (seconds) 5 min. = 300 (seconds) 20min. = 1200 (seconds) **2.** 72 hours = 3 (days) 120 hours = 5 (days) 2 weeks = 14 (days) 3 weeks = 21(days) 4 weeks = 28 (days) **3.** 70 minutes/1 hour and 10 minutes, 140 minutes/2 hours and 20 minutes, 135 minutes/2 hours and 15 minutes, 180 minutes/3 hours **4.** 1 year 3 months **5.** 32 days.

Chapter 12:

Exercise- Page-142

1. 48, 27, 35, 14 **2-3.** Do yourself.

Chapter 13:

Exercise- Page-154

1. a. obtuse angle b. right angle c. straight angle d. acute angle **2.** a=15° b=107° **3.** Do yourself. **4.** 55°, 135°/45°/135° **5.** a. 210° b. 360° c. 270° **6.** Do yourself.

Chapter 14:

Exercise- Page-160

1. Do yourself **2.** Triangle (1) isosceles, acute; triangle (2) equilateral, acute; triangle (3) scalene, right angled **3.** Do yourself

Academic year 2018, Math-4

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শেখ হাসিনার বাংলাদেশ

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